Exhibit No. 4

MAWC – Exhibit 4
Ann E. Bulkley
Rebuttal Testimony
File No. WR-2022-0303

PUBLIC VERSION
** _____ ** Denotes Confidential
*** _____ *** Denotes Highly Confidential

Exhibit No.	
Issues:	Return on Equity and Capital Structure
Witness:	Ann E. Bulkley
Exhibit Type:	Rebuttal
Sponsoring Party:	Missouri-American Water Company
Case No.	WR-2022-0303
Date:	January 18, 2023

MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. WR-2022-0303

REBUTTAL TESTIMONY

OF

ANN E. BULKLEY

ON BEHALF OF

MISSOURI-AMERICAN WATER COMPANY

AFFIDAVIT

I, Ann E. Bulkley, under penalty of perjury, and pursuant to Section 509.030, RSMo, state that I am a Principal for The Brattle Group, that the accompanying testimony has been prepared by me or under my direction and supervision; that if inquiries were made as to the facts in said testimony, I would respond as therein set forth; and that the aforesaid testimony is true and correct to the best of my knowledge and belief.

Ann E. Bulkley

January 17, 2023
Dated

REBUTTAL TESTIMONY
ANN E. BULKLEY
MISSOURI-AMERICAN WATER COMPANY
CASE NO. WR-2022-0303

TABLE OF CONTENTS

I. INTRODUCTION AND PURPOSE 1
II. SUMMARY AND OVERVIEW 2
III. UPDATED COST OF EQUITY ANALYSES 6
IV. CAPITAL MARKET CONDITIONS 9
V. REBUTTA L OF CAPITAL STRUCTURE ISSUES 19
VI. REBUTTAL OF COST OF EQUITY ISSUES 39
A. Proxy Group 49
B. DCF Analysis 51
C. CAPM 60
D. "Rule of Thumb" Approach 73

REBUTTAL TESTIMONY

ANN E. BULKLEY

I. INTRODUCTION AND PURPOSE

Q. Please state your name and business address.

A. My name is Ann E. Bulkley. I am employed by The Brattle Group as a Principal. My business address is One Beacon Street, Suite 2600, Boston, Massachusetts 02108.

Q. On whose behalf are you submitting this testimony?

A. I am testifying on behalf of Missouri-American Water Company ("MAWC" or the "Company"), a wholly-owned subsidiary of American Water Works Company, Inc. ("AWK" or "American Water").

Q. Did you previously provide direct testimony in this proceeding?

A. Yes. I filed direct testimony in this proceeding July 1, 2022.

Q. What is the purpose of your Rebuttal Testimony?

A. The purpose of my rebuttal testimony is to respond to the direct testimonies of Randall T. Jennings on behalf of the Missouri Public Service Commission Staff ("Staff") and David Murray on behalf of the Missouri Office of the Public Counsel ("OPC") regarding their respective proposals for the capital structure and return on equity ("ROE") for MAWC in this proceeding.

Q. Are you sponsoring any schedules as part of your Rebuttal Testimony?

A. Yes, I am sponsoring Schedules AEB-R-1 through AEB-R-13.

Q. How is the remainder of your Rebuttal Testimony organized?

A. The remainder of my Rebuttal Testimony is organized as follows:

- Section II provides a summary and overview of my rebuttal testimony and the important factors to be considered in establishing the ROE for MAWC.
- Section III summarizes my updated cost of equity analyses based on market data as of November 30, 2022.
- Section IV provides my response to the testimony of Mr. Jennings and Mr. Murray regarding capital market conditions and the implications for MAWC's cost of equity.
- Section V provides my response to Mr. Jennings's and Mr. Murray's recommended capital structures for MAWC in this proceeding.
- Section VI provides my response to the cost of equity analyses and recommendations of Mr. Jennings's and Mr. Murray.

II. SUMMARY AND OVERVIEW

Q. Have your positions changed as a result of the review of the direct testimonies of Mr. Jennings and Mr. Murray?

A. No. After reviewing the testimonies of Mr. Jennings and Mr. Murray, there is nothing in their respective testimonies that has caused me to change the positions set forth in my Direct Testimony, including the range of results within which the Company's ROE should be set or my specific ROE recommendation.

Q. What are your key conclusions and critiques regarding the appropriate ROE and capital structure for MAWC in this proceeding?

A. My key conclusions and specific critiques of the assumptions and analyses relied upon by Mr. Jennings and Mr. Murray are as follows:

Capital Structure

1. Mr. Jennings and Mr. Murray propose that American Water's consolidated capital structure be applied to MAWC for ratemaking purposes; however, pursuant to the stand-alone principle of ratemaking, regulated rates should be based solely on the risks and benefits of the regulated utility, not its investors, parent or affiliates. In fact, Mr. Jennings acknowledges that American Water has less risk than MAWC as a result of American Water's diversification of risk by operating in multiple jurisdictions across the U.S. However, both Mr. Jennings and Mr. Murray ignore this difference when proposing to use American Water's capital structure for MAWC.

2. In the current proceeding, the Commission is establishing the cost of capital for MAWC's operations in Missouri, not a combination of MAWC and its affiliates across the United States that is encompassed by the consolidated capital structure of American Water. MAWC's actual capital structure is consistent with the capital structures of the utility operating subsidiaries in the proxy group.

3. While MAWC has been able to take advantage of the comparatively lower cost debt financing available from AWCC for the benefit of its customers, simply because benefits for customers have been derived from this financing structure does not in turn justify ignoring MAWC's stand-alone capital structure and imposing American Water's consolidated capital structure for rate making purposes.

4. In making their recommendations regarding capital structure, Mr. Jennings and Mr. Murray fail to consider the relationship between the ROE and the capital structure in determining the overall cost of capital. Given the relationship between the equity ratio and the required equity return, because MAWC's actual capitalization is consistent with that of the utility operating subsidiaries of the proxy group, imputing a capital structure that differs significantly from the actual capitalization of MAWC and the proxy group would result in increased risk relative to the proxy group that should be reflected in the authorized ROE. Mr. Jennings's and Mr. Murray's recommended equity ratios, in combination with their ROE

recommendations, do not meet the comparable return standard of *Hope* and *Bluefield*.

5. Imputing American Water's consolidated capital structure to MAWC for rate making purposes may reduce the proactive investments in capital expenditures in the MAWC system and may reduce the investment in troubled water utility systems in Missouri, which would be contrary to the best interests of Missouri customers. Mr. Murray recognizes that: (i) MAWC's funds from operations ("FFO")-to-debt ratios have been in the range of approximately 19 to 20 percent; (ii) American Water was downgraded in 2019 when it had an FFO-to-debt ratio of 16 percent; (iii) American Water's FFO-to-debt ratio has been approximately 13 percent to 14 percent the past few years; and (iv) American Water's FFO-to-debt ratio is expected to decline to 12 to 13 percent over the next few years. Consequently, it is reasonable to assume that if American Water's capital structure is used for MAWC's ratemaking purposes, and thus MAWC's FFO-to-debt ratio were to match or be similar to American Water's current credit metrics, it would negatively affect MAWC's ability to attract capital within American Water and MAWC's financial strength would be weakened, thus limiting MAWC's options for access to capital financing outside of American Water.

Cost of Equity

6. Neither Mr. Jennings nor Mr. Murray directly rely on the results of their cost of equity models directly for purposes of their ROE recommendations, which is not surprising considering that their results are well below any recently authorized ROE for a water utility and not reasonable estimates of the cost of equity for MAWC. Mr. Jennings ignores the low results of his models by conducting a comparative cost of equity analysis such that he only relies on the difference in the cost of equity between his flawed analyses as opposed to the model results themselves. Similarly, Mr. Murray ignores the low results of his cost of equity models and recommends an ROE that is outside the range of estimates produced by his models.

7. I agree with Mr. Jennings's conclusion that changed market conditions since Spire Inc.'s 2021 rate case ("2021 Spire Case") indicate an increase in the cost of equity.[1] However, Mr. Jennings inexplicably truncates his comparative cost of equity analysis at June 30, 2022 (*i.e.*, 2Q/2022), thus failing to account for significant capital market changes since that time that affect the cost of equity. In fact, when Mr. Jennings's cost of equity analyses are updated to reflect current data – and no other changes are made to his assumptions or analyses – the results of his models support an authorized ROE for MAWC of 10.50 percent in this proceeding.

8. While neither Mr. Jennings nor Mr. Murray rely on the results of their cost of equity models directly for purposes of their ROE recommendations, their analyses are flawed in a number of additional ways, including relying on unrealistically low growth rate projections in their DCF analyses and incorrectly calculating market risk premiums in their CAPM analyses. While I address the methodological shortcoming of respective analyses, because these witnesses have placed no weight on the results of their own analyses, it would be reasonable and appropriate for the Commission to do the same.

9. When updating the cost of equity estimation models for data through November 30, 2022, regardless of whether the combined water/natural gas utility proxy group is used or whether a water-only utility proxy group is used, demonstrates that the cost of equity has increased since the filing of my Direct Testimony. Thus the cost of equity results of either proxy group supports my recommended ROE of 10.50 percent.

10. While the analytical results of cost of equity estimation models provide a starting point, my recommendation also considers other factors, including company-specific risk factors, capital market conditions and the capital attraction standard.

---

[1] As discussed herein, while Mr. Jennings suggests that there are two mitigating factors to the increase in the cost of equity (*i.e.*, lower projected growth rates and higher utility stock prices) since the 2021 Spire Case. Mr. Jennings's conclusion would change when his comparisons are both corrected and updated to reflect current market data.

Considering the financial and business risk factors facing MAWC, an ROE of 10.50 percent is reasonable and appropriate.

III. UPDATED COST OF EQUITY ANALYSES

Q. Have you updated your cost of equity models for more current market data?

A. Yes, I have updated my cost of equity analyses based on data through November 30, 2022. In updating my analyses, I have made two changes to the proxy group: (1) I have removed York Water from the proxy group because there is insufficient analyst coverage for this company; and (2) I have shown the mean discounted cash flow ("DCF") results both with and without Middlesex Water Company since Mr. Jennings includes the company in his DCF analysis and Mr. Murray excludes the company from his DCF analysis.[2] In addition to updating the results for my combined water and natural gas and utility proxy group, I have also provided updated results using a water utility-only proxy group consistent with the proxy group approach used by Mr. Jennings and Mr. Murray.

The results of my updated analyses for my combined water and natural gas utility proxy group are summarized in Figure 1. When these updated results are compared to the results in Figure 17 of my Direct Testimony,[3] it demonstrates that the cost of equity has increased substantially since July 2022. For example, the mean and median DCF results using the average growth rate have increased by 73 basis points and 55 basis points, respectively, and the capital asset pricing model ("CAPM") and empirical CAPM ("ECAPM") results have increased as well.

---

[2] Both Mr. Jennings and Mr. Murray include Middlesex Water company in their respective CAPM analyses.
[3] Bulkley DT, p. 80.

Figure 1: Updated Cost of Equity Model Results – Combined Proxy Group[4]

		Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Constant Growth DCF Mean	30-Day Average	9.03%	10.19%	11.54%
	90-Day Average	9.01%	10.17%	11.51%
	180-Day Average	8.98%	10.14%	11.49%
	Constant Growth Average	9.01%	10.17%	11.51%
Constant Growth DCF Median	30-Day Average	8.63%	10.03%	10.87%
	90-Day Average	8.64%	9.87%	10.81%
	180-Day Average	8.64%	9.84%	10.74%
	Constant Growth Average	8.64%	9.91%	10.80%

		Current 30-Day Avg 30-Yr Treasury Bond Yield	Near-Term Projected 30-Yr Treasury Bond Yield	Long-Term Projected 30-Yr Treasury Bond Yield
CAPM	Value Line Beta	11.03%	11.03%	11.00%
	Bloomberg Beta	10.69%	10.69%	10.66%
	Long-term Avg. Beta	10.30%	10.30%	10.25%
ECAPM	Value Line Beta	11.43%	11.43%	11.41%
	Bloomberg Beta	11.18%	11.18%	11.15%
	Long-term Avg. Beta	10.88%	10.88%	10.85%

The results of the water utility proxy group are summarized in Figure 2. This proxy group of water utilities is generally consistent with the proxy groups relied upon by Mr. Jennings and Mr. Murray, except that I have excluded MAWC's parent company, American Water, due to the circularity that might otherwise result from its inclusion. In comparing Figure 1 and Figure

[4] Constant Growth DCF mean results exclude Middlesex Water Company.

2, the DCF results for the water utility proxy group are substantially higher than the combined water and natural gas utility proxy group, and the CAPM and ECAPM results are moderately lower.

Figure 2: Updated Cost of Equity Model Results – Water Proxy Group

		Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Constant Growth DCF Mean	30-Day Average	8.77%	10.48%	12.41%
	90-Day Average	8.82%	10.53%	12.45%
	180-Day Average	8.87%	10.58%	12.51%
	Constant Growth Average	8.82%	10.53%	12.46%
Constant Growth DCF Median	30-Day Average	8.21%	10.29%	12.69%
	90-Day Average	8.25%	10.21%	12.60%
	180-Day Average	8.32%	10.21%	12.60%
	Constant Growth Average	8.26%	10.23%	12.63%

		Current 30-Day Avg 30-Yr Treasury Bond Yield	Near-Term Projected 30-Yr Treasury Bond Yield	Long-Term Projected 30-Yr Treasury Bond Yield
CAPM	Value Line Beta	10.58%	10.58%	10.54%
	Bloomberg Beta	10.60%	10.60%	10.56%
	Long-term Avg. Beta	10.27%	10.27%	10.22%
ECAPM	Value Line Beta	10.71%	10.71%	10.67%
	Bloomberg Beta	11.18%	11.18%	11.16%
	Long-term Avg. Beta	10.82%	10.82%	10.78%

Q. Do the results of combined water/natural gas and/or water utility only proxy groups support your recommended ROE for the Company in this proceeding?

A. Yes. The results of both the combined water/natural gas and water-only proxy groups reflecting data through November 30, 2022 support my recommended ROE of 10.50 percent.

IV. CAPITAL MARKET CONDITIONS

Q. What is Mr. Jennings's position on capital market conditions and the implications for the cost of equity?

A. In his direct testimony, Mr. Jennings discusses various economic and capital market conditions currently impacting utility costs of equity. On the one hand, Mr. Jennings states that there is an increased market risk that increases the cost of equity for utilities. For example, Mr. Jennings highlights that the economy has experienced enormous volatility since 2020, inflation has been persistently at 40-year highs for much of 2022, and interest rates are expected to continue to increase. As Mr. Jennings states, "[c]urrently, U.S. economic conditions, including higher inflation and interest rates as discussed in this testimony, indicate a higher cost of equity than the 2021 Spire Case."[5]

On the other hand, however, Mr. Jennings also states that, "[h]igher stock prices and lower projected growth rates both indicate a lower COE [*i.e., cost of equity*]."[6] Mr. Jennings's conclusion regarding higher stock prices is based on a comparison of the average utility

---

[5] Jennings DT, p. 13; referencing Missouri Public Service Commission, Case No. GR-2021-0108, Report and Order, October 27, 2021 ("Spire 2021 Case").

[6] *Id.* at 16; clarification added.

stock price for his proxy group for Q1/2021 at the time of the Commission's decision in the 2021 Spire Case (*i.e.*, $78.64/share) and for Q2/2022 (*i.e.*, $80.93/share).[7] Mr. Jennings also analyzes average utility projected growth rates over these same two time periods, concluding that the projected growth rates have decreased from 6.58 percent to 6.50 percent.[8]

Ultimately, Mr. Jennings concludes that, "[t]he combined net result of the increase in interest rates and the changes in overall market conditions is an increase in COE since the 2021 Spire Case."[9]

Q. Do you agree with Mr. Jennings's conclusion regarding the effect of capital market conditions on the utility cost of equity?

A. I agree with Mr. Jennings's overall conclusion that the effect of current and projected capital market conditions has resulted in an increase in the utility cost of equity. However, I do not agree with Mr. Jennings's analyses in which he concludes that utility stock prices have increased and projected growth rates have decreased since the 2021 Spire Case, thus mitigating the increase in the utility cost of equity.

---

[7] Schedule RTJ-d12. Reflects an average of the high and low stock prices for Mr. Jennings's proxy group for each of the months of Q1/2021 and Q2/2022.

[8] Schedule RTJ-d11. Reflects an average of the projected earnings per share, dividend per share and book value per share growth rates for Mr. Jennings's proxy group.

[9] Jennings DT, p. 19.

Q. Why do you disagree with Mr. Jennings's conclusions regarding higher utility stock prices and lower projected growth rates since the 2021 Spire Case?

A. Mr. Jennings's analysis of capital market conditions is based on data only through the end of Q2/2022, which is significant because it does not account for the increases in interest rates or the changes in overall market performance of utility stocks since that time.

Q. Do water utilities currently have lower growth rates as compared to the time of the Spire 2021 Case?

A. No. First, Mr. Jennings's comparison of the projected growth rates for the water utilities as of Q2/2022 is incorrect. As shown on Schedule AEB-R-8, page 1, which is Mr. Jennings's Schedule RTJ-d11, Mr. Jennings suggests that the average projected growth rate for the water utilities was 6.58 percent in Q1/2021 and 6.50 percent in Q2/2022. However, the *Value Line Investment Survey* ("*Value Line*") reports that would have been available for the water utilities that would have been available as of the end of Q2/2022 (*i.e.*, June 2022) would have been from April 8, 2022. Therefore, as shown on Schedule AEB-R-8, page 2, when Mr. Jennings's comparison is corrected to reflect the most current reports that would have been available as of his Q2/2022 comparison point, the average growth rate for the water utilities was actually 6.69 percent, which is *higher* than the average projected growth rate as of Q1/2021 at the time of the 2021 Spire Case.

Regardless of Mr. Jennings's incorrect comparison as of Q2/2022, his comparison is also inapt because he has not reflected current data even though his direct testimony was filed at the end of November 2022. When Mr. Jennings's comparison is updated to rely on the most current data through the end of November 2022, the average growth rates for these proxy group companies is 7.14 percent, higher than the corrected comparison between

Q2/2022 and Q1/2021 on which Mr. Jennings relies. Therefore, once either corrected or updated, Mr. Jennings's own growth rate comparison indicates that the cost of equity has increased for water utilities since the 2021 Spire Case.

Q. Is Mr. Jennings's analysis of utility stock prices similarly affected by the fact that he only relied on data through Q2/2022?

A. No, the fact that Mr. Jennings only evaluated utility stock prices through Q2/2022 does not meaningfully change the comparison because the 3-month average utility stock prices in Mr. Jennings's comparison were effectively the same as of the end of November 2022 as they were as of the end of June 2022. Regardless, I disagree with Mr. Jennings's suggestion that increased utility stock prices since the 2021 Spire Case have mitigated, in part, the overall market conditions that indicate an increase in the utility cost of equity. As shown on Schedule AEB-R-9 (and on Mr. Jennings's Schedule RTJ-d12), utility stock prices have increased only marginally since the 2021 Spire Case – only 2.6 percent. That is not a sufficiently meaningful increase since the 2021 Spire Case such that it would mitigate the other market conditions that are indicative of an increase in the cost of equity since that time.

Q. Specifically, by only focusing on capital market conditions through Q2/2022 for his analysis, what information has Mr. Jennings omitted from his analysis that may be relevant to assessing the cost of equity for MAWC in current market conditions?

A. In his direct testimony, Mr. Jennings specifically acknowledges the November 2022 increase in the federal funds rate by the Federal Reserve[10] and that interest rates are expected to continue to increase;[11] however, for some reason, Mr. Jennings truncated his comparative analysis of water utility projected growth rates and stock prices since the 2021 Spire Case to Q2/2022, which does not account for significant changes in the market. Specifically, since Q2/2022, the Federal Reserve have implemented three additional interest rate increases, two of which have been 75 basis point increases and the other a 50 basis point increase, which has raised the federal funds rate to a range of 4.25 percent to 4.50 percent. Further, the Federal Reserve has indicated that expects that inflation will remain elevated above the Federal Reserve target level over at least the next year and that it will continue to increase interest rates to reduce inflation. For example, Federal Reserve Chair Powell at the Federal Open Market Committee meeting in December 2022 anticipated further increases in the federal funds rate, and that while inflation is off of its recent highs, it remains significantly above the Federal Reserve's long-term target:

> We continue to anticipate that ongoing increases will be appropriate in order to attain a stance of monetary policy that is sufficiently restrictive to return inflation to 2 percent over time.
>
> …..
>
> Inflation remains well above our longer-run goal of 2 percent. Over the 12 months ending in October, total PCE prices rose 6 percent; excluding the

[10] Jennings DT, p. 10.

[11] *Id.*, at 13.

> volatile food and energy categories, core PCE prices rose 5 percent. In November, the 12-month change in the CPI was 7.1 percent, and the change in the core CPI was 6 percent. The inflation data received so far for October and November show a welcome reduction in the monthly pace of price increases. But it will take substantially more evidence to give confidence that inflation is on a sustained downward path.
>
> …..
>
> As shown in the SEP [*i.e., Summary of Economic Projections*], the median projection for the appropriate level of the federal funds rate is 5.1 percent at the end of next year, 1/2 percentage point higher than projected in September. The median projection is 4.1 percent at the end of 2024 and 3.1 percent at the end of 2025, still above the median estimate of its longer-run value.
>
> …..
>
> And today we're -- the SEP they were published shows again that overwhelmingly FOMC participants believe that inflation risks are to the upside.
>
> …..
>
> You know, our focus right now is really on moving our policy stance to one that is restrictive enough to ensure a return of inflation to our 2 percent goal over time. It's not on rate cuts. And we think that we'll have to maintain a restrictive stance of policy for some time. Historical experience caution strongly against prematurely loosening policy. I guess I would say it this way: I wouldn't see us considering rate cuts until the Committee is confident that inflation is moving down to 2 percent in a sustained way. So that's the -- that's the test I would articulate. And you're correct. There are not rate cuts in the SEP for 2023.[12]

Similarly, Vice Chair Lael Brainard has noted that:

> I think it will probably be appropriate soon to move to a slower pace of increases. *But I think what's really important to emphasize -- we've done a lot, but we have additional work to do both on raising rates and sustaining restraint to bring inflation down to 2% over time*.
>
> We have raised rates very rapidly by nearly four percentage points over about nine months and we've been reducing the balance sheet, and you can see that in financial conditions. You can see it in inflation expectations, which are quite well anchored. You can see it in interest-rate-sensitive sectors.

[12] Transcript, Chair Powell, Press Conference, December 14, 2022.

> But as we said last meeting, there are likely to be lags and it's going to take some time for that cumulative tightening to flow through. And so it makes sense to move to a more deliberate and a more data-dependent pace as we continue to make sure that there's restraint that will bring inflation down over time.[13]

Finally, Federal Reserve Governor Christopher Waller has also reiterated that the Federal Reserve believes there is still significant progress that needs to be made to bring inflation down to the Federal Reserve's long-term target of 2 percent. At the UBS Group AG conference on November 13, 2022, Federal Reserve Governor Waller stated:

> "*These rates are going to stay -- keep going up -- and they're going to stay high for a while until we see this inflation get down closer to our target*," Waller said Monday at a UBS Group AG conference in Sydney. "*We've still got a ways to go. This isn't ending in the next meeting or two*."[14]

Q. What are your conclusions about the effect of inflation and interest rates on the cost of equity?

A. Overall, I agree with Mr. Jennings that the cost of equity has increased for water utilities since the 2021 Spire Case. Based on the recent market conditions, and more recent views offered by the Federal Reserve than were reflected in Mr. Jennings's comparative analysis, it is reasonable to expect that the federal funds rate will increase to combat persistently high inflation. I agree with Mr. Jennings that "all else being equal, high inflation

---

[13] "Lael Brainard Talks Fed Interest Rates, Inflation, Crypto in Exclusive Interview," Bloomberg.com, November 14, 2022; https://www.bloomberg.com/news/articles/2022-11-14/fed-s-brainard-on-rates-inflation-crypto-labor-and-more-q-a. (emphasis added).

[14] Pandey, Swati, "Fed's Waller Says There's a 'Ways to Go' before Rate Hikes Done," Bloomberg.com, Bloomberg, November 13, 2022; https://www.bloomberg.com/news/articles/2022-11-13/fed-s-waller-says-there-s-a-ways-to-go-before-rate-hikes-done. (emphasis added).

expectations lead to higher interest rates."[15] I also agree with Mr. Jennings that as interest rates remain elevated relative to the recent past, it is reasonable to expect utilities' cost of equity to remain elevated in the near future, recognizing that there is not a perfect positive correlation.[16] However, given the most recent market data, the fact that average projected growth rates for water utilities have increased – not decreased as suggested by Mr. Jennings – since the 2021 Spire Case, and water utility stock prices are effectively at the same level now as at the time of the 2021 Spire Case, this is indicative that the cost of equity has substantially increased since the 2021 Spire Case.

Q. What are Mr. Murray's views on capital market conditions?

A. Mr. Murray recognizes that market conditions have changed significantly since the end of 2021, noting that the yield on long-term bonds have "increased dramatically," almost double the yield since that time-period.[17] Contrary to his views in the Company's prior rate case, where he suggested that interest rates were low and therefore the cost of equity was low, in this case, Mr. Murray now suggests that, despite the substantial increase in bond yields, the cost of equity has "remained fairly stable" since MAWC's 2020 rate case because of the high valuations of water utility stocks, including the premium to which water utility stocks are trading to electric utilities.[18] Mr. Murray further asserts that capital markets have "not traded consistent with underlying fundamentals."[19]

---

[15] Jennings DT, p. 12.

[16] *Id.*, at 13.

[17] Murray DT, p. 9.

[18] *Id.*, at 2.

[19] *Id.*, at 10.

Q. Has Mr. Murray recognized how the current, high valuations of the utilities sector affect the results of the models used to estimate the cost of equity?

A. No, he does not acknowledge that high valuations depress the dividend yield in the DCF model. In order to determine whether the results of the DCF model are reasonable, it is important to consider whether the current market conditions will persist during the rate period. While Mr. Murray correctly observes that valuations for water utilities remain well above historical averages, analysts do not expect the current price levels to be sustainable. As I noted in my Direct Testimony, equity analysts project that utilities are likely to underperform the broader market as interest rates increase.[20] In fact, as discussed later herein, Zacks ranks the water utility industry in the bottom 28 percent of all industries covered (*i.e.*, 178 out of 248) and currently has a "sell" recommendation for four of the six water utilities in Mr. Murray's proxy group, with a "hold" recommendation on the other two.[21] To the extent that analysts and investors expect the water utility sector to underperform, the current dividend yields reflected in the DCF model, which reflect relatively high stock price valuations, will understate the forward-looking cost of equity.

Q. Do you agree with Mr. Murray's assertion that "the required return on utility stocks may not be that much higher than current coupons on bonds?"[22]

A. No. Mr. Murray opines that investors will prefer utility stocks to bonds, as utilities can pass on higher costs to customers, thus protecting investors from further rises in inflation.

---

[20] Bulkley DT, p. 27.

[21] Zacks Investment Research; https://www.zacks.com/stocks/industry-rank/industry/utility-water-supply-196.

[22] Murray DT, p. 26.

While I agree that utilities may have the opportunity, assuming favorable regulatory treatment, to include prudently-incurred costs through rates, the contention that the required returns on utility stocks "may not be much higher than current coupons on bonds" has no basis. Owners of common equity hold a residual claim on the net assets of a utility. The presence of any debt in a capital structure increases the risk to equity holders, as their claim ranks lower. As such, the required return of equity holders must be materially higher than the required return of debt holders; a point Mr. Murray implicitly endorses through his "rule of thumb" analysis, where he suggests a risk premium of 3.00 percent to 4.00 percent relative to current bond yields. Thus, Mr. Murray's own methodology endorses the idea that the cost of equity must be higher than the equivalent cost of debt, but he chooses to ignore that fact when reviewing market conditions.

Q. Is Mr. Murray consistent in his interpretations of how capital market conditions affect the ROE for MAWC from the Company's prior case?

A. No. In his 2020 testimony, Mr. Murray argued that a rise in the price-to-earnings ("P/E") ratios for American Water and the water utility industry more generally were attributable to low business risk and a decline in long-term interest rates.[23] Now that long-term interest rates have risen substantially, Mr. Murray instead argues that the rise in P/E ratios is attributable to low business risk and high demand for American Water's stock due to favorable environmental, social, and governance ("ESG") characteristics. American Water has not meaningfully changed its regulated operating businesses since November 2020, so any favorable ESG characteristics are not new to investors. It is clear that Mr. Murray is

[23] Missouri Public Service Commission, Case No. WR-2020-0344, Direct Testimony of David Murray, at 15.

simply updating his rationale for a desired outcome – a lower or similar cost of equity for MAWC – rather than consistently interpreting market conditions.

V. REBUTTAL OF CAPITAL STRUCTURE ISSUES

Q. What is Mr. Jennings's recommendation regarding the appropriate capital structure for MAWC for ratemaking purposes?

A. Mr. Jennings states that the capital structures of MAWC and its parent, American Water, are generally unchanged over the past three rate proceedings, and Staff has consistently recommended that the Commission use the consolidated capital structure of American Water for MAWC's ratemaking capital structure.

For these reasons, Mr. Jennings recommends a capital structure for MAWC that reflects American Water's capital structure as of June 30, 2022, which is composed of 40.71 percent common equity, 59.28 percent long term debt, and 0.02 percent preferred equity.[24] Mr. Jennings recommends that MAWC's cost of debt should be 4.08 percent, which is American Water's embedded cost of debt as of June 30, 2022. Similarly, Mr. Jennings recommends that MAWC's cost of cost of preferred stock should be 8.77 percent, which is American Water's embedded cost of preferred stock as of June 30, 2022.[25]

---

[24] *Id.*, at 27.

[25] *Id*., at 38.

Q. What is Mr. Murray's position with respect to the appropriate capital structure for MAWC?

A. For reasons similar to those proposed by Staff, Mr. Murray proposes that MAWC's capital structure be based on American Water's consolidated capital structure. Specifically, Mr. Murray recommends MAWC's capital structure be set equal to American Water's average quarterly consolidated capital structure, net of short term debt, for the period from June 30 2021 through June 30, 2022,[26] so long as the Commission orders MAWC to include short-term debt in its calculation of allowance for funds used during construction ("AFUDC"). This would result in a capital structure composed of 40.45 percent equity and 59.55 percent long-term debt.[27]

Q. Do you agree with Mr. Jennings that the MAWC capital structure should be similar to the American Water capital structure?

A. No, I do not. A foundation for Mr. Jennings's conclusion that the MAWC capital structure should be similar to the American Water capital structure is that the entities bear similar risk. Mr. Jennings states that if "the business risks of the parent company are similar to those of the subsidiary, then each entity should be able to incur similar amounts of financial risk. Presumably, this should cause their capital structures to be fairly similar."[28] Mr. Jennings has provided no evidence that demonstrates that the business risks of American Water and MAWC are similar. In fact, the business risks of these two entities are not

---

[26] Murray DT, p. 40.

[27] *Id*.

[28] Jennings DT, p. 24.

similar. American Water is in the business of providing liquidity and credit management to many water utility operating companies. MAWC is engaged in the provision of water and wastewater services to a defined population with a defined distribution system. The risk profiles of MAWC and American Water are not similar because American Water has the benefit of diversification of its business operations across more than a dozen regulatory jurisdictions across the U.S., whereas MAWC's operations are consolidated in a single jurisdiction, with the risks of its business operations also in that one jurisdiction.

Q. Does Mr. Jennings agree that diversification reduces risk?

A. Yes. Mr. Jennings agrees that diversification reduces risk and therefore can increase leverage, and recognizes this risk difference between American Water and MAWC; however, he ignores this important distinction when he proposes the use of the American Water capital structure for MAWC's ratemaking capital structure. Specifically, Mr. Jennings states:

> Fourth, due to diversified equity investments in subsidiaries, it is reasonable to assume that AWWC can take on greater leverage than MAWC because of its lesser financial and business risk. Staff notes that it is not always appropriate to use the parent company's cost of common equity if the parent company's risk profile is significantly different from that of its regulated subsidiaries.[29]

Mr. Jennings's failure to address this difference in risk between American Water and MAWC, through either his capital structure or recommended ROE for MAWC, is

[29] *Id,* at 25.

inconsistent with the comparable return standard set forth in *Hope* and *Bluefield* that has been upheld by the Commission.[30]

Q. What does Mr. Jennings state regarding unregulated operations and capital structure?

A. While Mr. Jennings suggests that non-utility operations are a factor to consider in determining which capital structure should be used, he does not explain how that factor should be considered. However, the implication from Mr. Jennings's testimony is that a relatively greater level of non-utility operations by the parent is indicative that the capital structure of the parent should be utilized for ratemaking purposes. Specifically, when listing the factors of the relationship between MAWC and American Water that support using the parent's capital structure, Mr. Jennings states:

> In addition, AWWC's unregulated operations contributed approximately 14% of its consolidated operating revenues in the years 2019 through 2021. In comparison, in the 2021 Spire Case, in which Spire Missouri's independent capital structure was used, Spire Inc.'s unregulated operations contributed approximately 5% of the parent company's revenue. AWWC's unregulated operations contribute almost three times as much revenue as Spire Inc.'s. Whether or not the parent company is diversified into non-utility operations, is a factor to consider when determining which capital structure should be used.[31]

Q. Is Mr. Jennings's comparison correct?

A. No. Mr. Jennings's comparison is incorrect as it both reflects an incorrect comparison and ignores American Water's current business operations. Further, Mr. Jennings analyses do

---

[30] *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591 (1944) ("*Hope*"); *Bluefield Waterworks & Improvement Co., v. Public Service Commission of West Virginia*, 262 U.S. 679 (1923) ("*Bluefield*").

[31] Jennings DT, p. 26.

not support his conclusion that it is appropriate to rely on the consolidated capital structure in the case of MAWC when the Commission has relied on the subsidiary capital structure in the case of Spire Missouri.

Q. Please explain why Mr. Jennings's comparison is incorrect.

A. The source of Mr. Jennings's data on the unregulated operating revenue of American Water is a data request response by the Company, which also provided more current data for Q1/2022, demonstrating that American Water's unregulated operations contributed 7.60 percent to its operating revenue.[32] In addition, as stated in American Water's Q2/2022 SEC Form 10-Q, which is consistent with the time period that Mr. Jennings has relied on for the remainder of his cost of equity analyses, American Water divested its primary unregulated business unit (*i.e.*, its unregulated homeowner services group). Therefore, Mr. Jennings has relied on data that is not representative of the American Water risk profile in this analysis and has developed a meaningless comparison of assets and operating revenue.

Q. Has Mr. Jennings recognized the benefits to MAWC's customers from its ability to obtain financing from American Water?

A. No. Mr. Jennings comes to the unsubstantiated conclusion that "[n]ot only would it be unreasonable and inappropriate to use MAWC's standalone capital structure to set MAWC's ROR, it would be more costly for ratepayers because of the higher equity ratio in MAWC's capital structure."[33] Mr. Jennings has provided no evidence that MAWC's standalone capital structure is either "unreasonable" or "inappropriate." Mr. Jennings

---

[32] MoPSC 0063_Attachment.

[33] Jennings DT, p. 25.

simply concludes that since debt has a lower cost than equity, more debt in the capital structure will result in a lower cost. However, Mr. Jennings fails to consider the financial risk associated with higher leverage: lower coverage ratios, lower credit ratings, and a higher cost of debt. In addition, higher leverage increases the risk to equity holders, who bear greater risk when an entity has higher leverage. Therefore, as leverage increases, the risk to equity holders increase, as does the investor-required cost of equity. Mr. Jennings has provided no evidence to support his conclusion, and his proposal to simply substitute debt for equity will not necessarily reduce cost for customers.

As discussed in the Direct Testimony of Company witness Mr. Merante,[34] the reliance on AWCC to issue debt has reduced the overall cost of debt for MAWC's utility customers as compared with MAWC acquiring debt on a stand-alone basis. Therefore, it is unreasonable to adjust MAWC's capital structure to reflect the American Water capital structure simply because MAWC primarily does not issue debt independently, when the use of a consolidated debt offering by AWCC has resulted in lower costs to customers.

Q. What are the options that are most often considered by utility regulatory commissions when setting a regulated utility's capital structure?

A. The three options that are most often considered for establishing a capital structure for ratemaking purposes are as follows:

- The utility operating company's actual (or projected) capital structure per the financial books and records of the company when this capital structure is reflective

[34] The Direct Testimony of Company witness James Merante has been adopted by Company witness J. Cas Swiz for purposes of this proceeding. See also the Rebuttal Testimony of J. Cas Swiz.

of the way the company is operated and it is generally consistent with industry norms.

- A hypothetical capital structure can be considered, especially if there are concerns that the actual per books capital structure is not reflective of the optimal capital structure for the utility operating company. The hypothetical capital structure can be based on comparable companies (*e.g.*, set within the range of the proxy group) or determined by the regulatory commission based on other risk factors.

- The parent company's consolidated capital structure has been applied when the utility operating company represents the vast majority of the parent holding company's operations, and therefore the financing for the operating company and the holding company are similar. This is not the case with AW and any of its subsidiaries, including MAWC.

Q. Is the Company's proposed capital structure consistent with industry norms and therefore reasonable for ratemaking purposes?

A. Yes, it is for several reasons. First, pursuant to the stand-alone principle of ratemaking, regulated rates should be based solely on the risks and benefits of the regulated utility, not its investors, parent or affiliates. In the current proceeding, the Commission is estimating the cost of capital for MAWC's operations in Missouri, not a combination of MAWC and its affiliates across the United States that is encompassed by the capital structure of American Water. Second, as discussed in the Direct Testimony of Mr. Merante, the Company's capital structure is reflective of the way the Company has been operated.[35] In addition, I have examined the capital structures of the operating companies of the proxy group as well as the capital structures that have recently been authorized for natural gas

[35] Merante DT, p. 9.

and water utilities. In each case, the Company's proposal is within the established range. As shown in Figure 3, the Company's proposed equity ratio is below the average of the actual equity ratios established by the utility operating companies held by the proxy group companies. In contrast, Staff's and OPC's proposed equity ratios are appreciably below the low end of the range set by the equity ratios of the proxy companies.

Figure 3: Equity Ratios of Proxy Companies

Proxy Group Company	Ticker	2021	2020	2019	3-yr Avg.
American States Water Company	AWR	59.69%	56.76%	55.40%	57.28%
Atmos Energy Corporation	ATO	59.88%	58.31%	57.85%	58.68%
California Water Service Group	CWT	49.24%	45.08%	43.23%	45.85%
Essential Utilities, Inc.	WTRG	53.56%	52.53%	52.80%	52.96%
Eversource Energy	ES	53.48%	54.23%	53.55%	53.76%
NiSource Inc.	NI	54.85%	54.43%	54.33%	54.54%
New Jersey Resources Corporation	NJR	51.75%	55.13%	57.55%	54.81%
Northwest Natural Gas Company	NWN	44.08%	41.92%	45.77%	43.92%
One Gas Inc.	OGS	61.09%	60.04%	63.28%	61.47%
SJW Corporation	SJW	50.91%	51.52%	50.40%	50.94%
Spire Inc.	SR	49.12%	52.78%	53.20%	51.70%
Proxy Group					
MEAN		53.42%	52.98%	53.40%	53.27%
LOW		44.08%	41.92%	43.23%	43.92%
HIGH		61.09%	60.04%	63.28%	61.47%

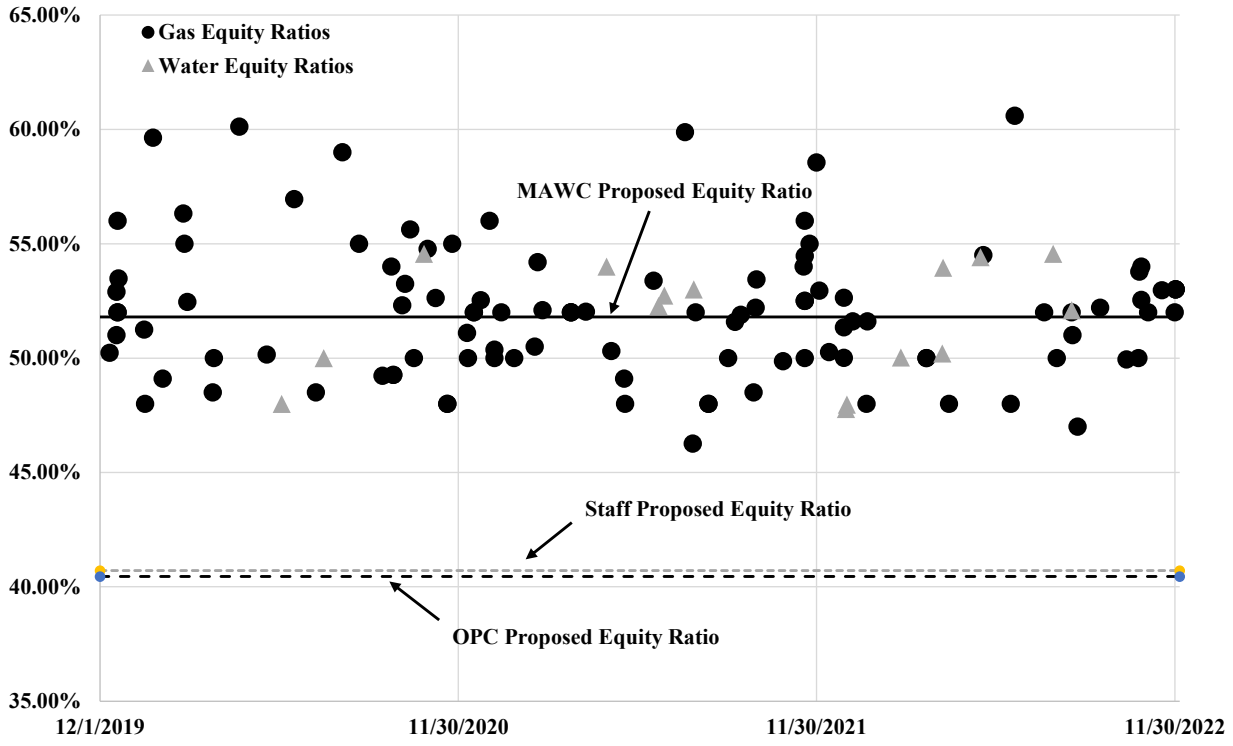
As discussed in my Direct Testimony, the equity ratio is a measure of the financial risk of a company and the authorized ROE is the return to compensate investors for that risk.[36] In this case, the appropriate ROE for MAWC is based on a cost of equity analysis of a proxy group of publicly traded companies. To the extent that the capital structure that is authorized for MAWC has significantly higher leverage than the proxy group, then the Commission is imposing greater risk than the proxy group companies. Therefore, that incremental risk should be reflected in a relatively higher authorized ROE.

[36] Bulkley DT, p. 73.

Q. How do the proposed equity ratios in this case compare with the equity ratios that have been recently authorized for water and natural gas utilities?

A. As shown in Figure 4, the majority of the recently authorized equity ratios for natural gas and water utilities are in the range of 50 percent to 55 percent. MAWC's proposed equity ratio of 51.80 percent is well within the range of authorized equity ratios for companies of comparable risk. In contrast, the Staff's and OPC's proposed equity ratios are well below every authorized equity ratio over this same time period.

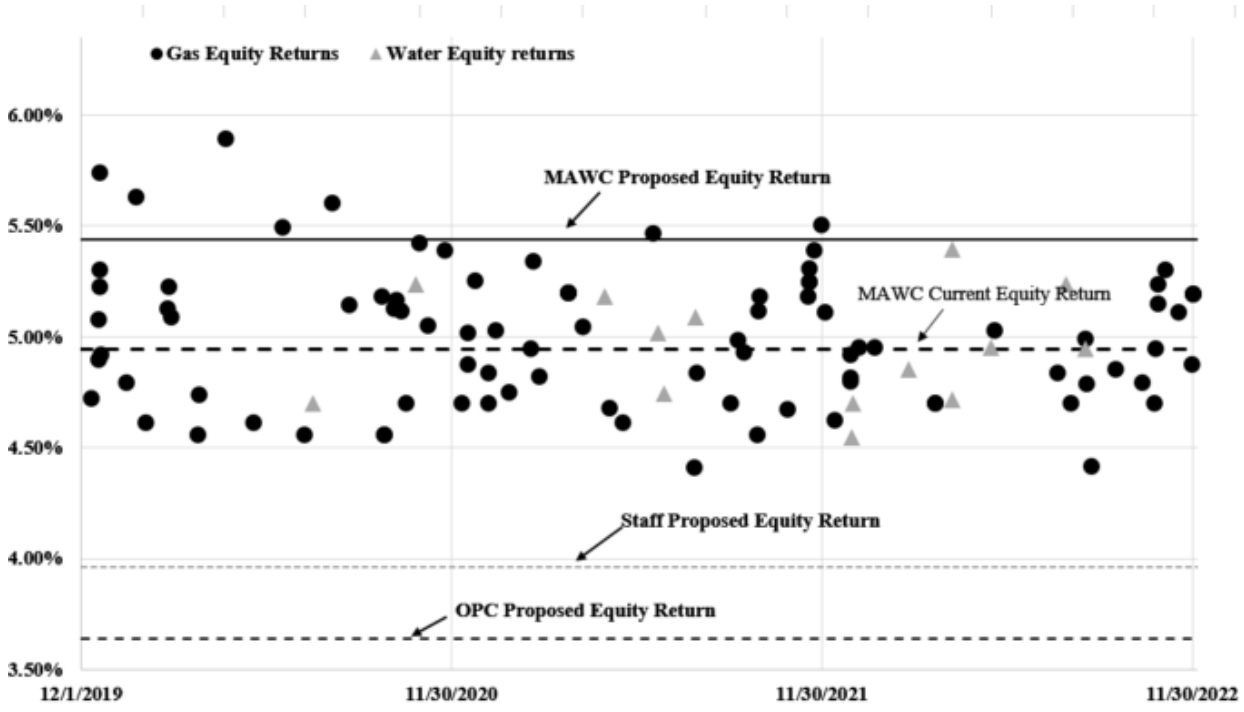
Figure 4: Average Authorized Equity Ratios for Natural Gas and Water Utilities over the Past Three Years[37]



[37] Chart excludes jurisdictions that include zero cost items in the capital structure: Arkansas, Indiana, Michigan and Florida.

As shown in Figure 5, OPC and Staff's proposed equity returns (equity ratio x ROE) are well below the authorized equity returns over the past three years.

Figure 5: Average Authorized Equity Returns for Natural Gas and Water Utilities over the Past Three Years[38]



Q. Would the use of consolidated capital structure for ratemaking purposes affect investment in MAWC?

A. Yes, it could. As discussed in the Rebuttal Testimony of Company Witnesses J. Cas Swiz, and Jeffery Kaiser, while the Company will always maintain a safe and reliable system, proactive investments in the MAWC system, as well as the acquisition of troubled water

[38] Chart excludes jurisdictions that include zero cost items in the capital structure: Arkansas, Indiana, Michigan and Florida. MAWC current equity return is based on an equity ratio of 51.80% and an ROE of 9.55%

systems likely will not continue to occur at current levels if they are not supported by regulatory policy.

Q. Could the use of the consolidated capital structure affect MAWC's access to capital?

A. Yes, it could. Authorizing a more leveraged capital structure could make it difficult to access capital on reasonable terms. While MAWC receives financing from AWCC, I understand that the Company has the option to seek financing elsewhere if it can obtain better terms than offered by AWCC. If MAWC needed to access capital from sources other than AWCC, imposing the consolidated capital structure on MAWC could result in weaker credit metrics that could limit MAWC's options for access to capital from sources other than AWCC.

Q. Why do you think that MAWC's credit metrics would be weaker if it were capitalized along the lines recommended by Staff and OPC?

A. As noted by Mr. Murray, MAWC's funds from operations ("FFO")-to-debt ratios have been in the range of **

[40] ** Considering that American Water was downgraded in 2019 with an

[39] Murray DT, p. 45.

[40] **

FFO to-debt ratio of 16 percent, it is reasonable to assume that if American Water's capital structure is used for MAWC's ratemaking purposes, and thus MAWC's FFO-to-debt ratio were to match or be similar to American Water's current credit metrics, MAWC's financial strength would be weakened, thus limiting MAWC's options for access to capital financing outside of American Water.

In fact, Moody's has recently stated that, ***

[41] :

[42]

***

**

41 ***

***

42 ***

***

Thus, implementing Staff's and OPC's proposal in which MAWC's regulated capital structure would reflect American Water's consolidated capital structure would be inconsistent with the financial expectations of the credit rating agencies and result in MAWC's FFO-to-debt ratio to decline to a level in which Moody's could downgrade the Company.

Q. Mr. Murray asserts that rating agencies, such as S&P Global Ratings, typically allow water utility companies to carry more leverage due to lower business risk associated with water utility assets. Is this a basis for applying American Water's consolidated capital structure to MAWC for ratemaking purposes?

A. No. While Mr. Murray claims that S&P "allows water utility companies to have funds from operations-to-debt (FFO/debt) ratios of as low 9% to 13% and still maintain an 'A' credit rating," he has disregarded or failed to acknowledge that Moody's, as just discussed, has specifically noted that a downgrade could occur if MAWC's FFO-to-debt ratio declines below 16 percent.

Q. Why is American Water still rated "investment grade" when it has a debt ratio similar to what Staff and OPC have proposed for MAWC?

A. As noted above, the rating agencies have noted that American Water benefits from the diversity of the utility operations in the large American Water system as part of their risk assessment. Specifically, Moody's has noted that American Water's credit profile is supported by 1) its market position as the largest U.S. investor-owned water utility holding company, 2) strong regulatory and operational diversity across 16 states, 3) improving regulatory support as more states adopt cost recovery trackers, and 4) improving business

risk profile following the sale of its largest non-utility business.[43] Consequently, the rating agencies recognize that the risk of American Water is lower than that of an entity operating in one jurisdiction or in one industry, and have reflected that lower risk in American Water's credit rating.

Q. Please respond to Mr. Murray's position that it is not fair to ask ratepayers to pay for higher-cost capital than American Water considers appropriate for its consolidated capital structure.

A. Mr. Murray recognizes that American Water benefits from the diversification of utility operations across many jurisdictions, and that the benefits of this lower risk profile are transferred to MAWC customers through the relatively lower financing costs achieved by AWCC than could otherwise be obtained if MAWC were to seek financing on a stand-alone basis.[44] Therefore, since the American Water capital structure consolidates the risk of its many operating companies, MAWC's customers are benefiting from that consolidated (and thus lower) risk in the form of low-cost debt achieved by AWCC. If MAWC is allowed to maintain its requested stand-alone capital structure, then MAWC's customers will also benefit from the resulting financial flexibility of having a relatively higher equity component consistent with its actual operations, which is important in the event there is a benefit from or a need to attract capital from a source other than AWCC.

---

[43] Moody's Investor Services, Credit Opinion, American Water Works Company, Inc., November 4, 2021, at 1. Note, since the issuance of Moody's credit opinion, American Water has divested its regulated utility operations in New York and Michigan, but continues to operate in multiple jurisdictions across the U.S.

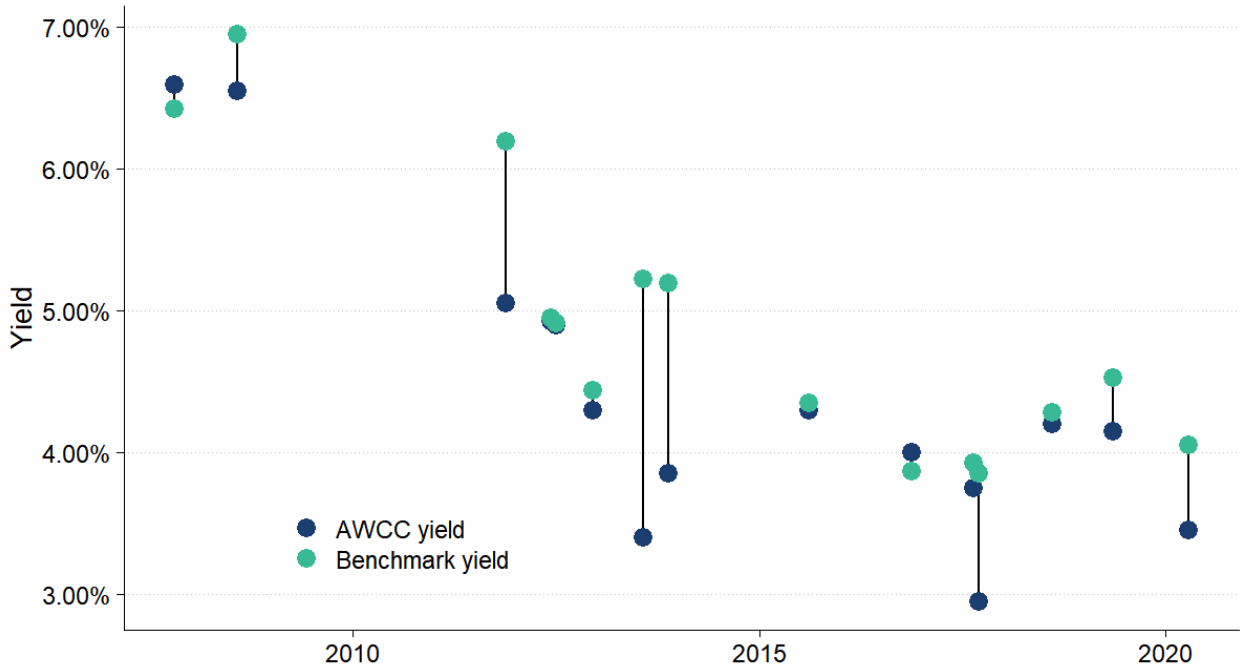
[44] Murray DT, p. 45.

Q. What analysis has been conducted to demonstrate that MAWC's financing through AWCC is low-cost financing?

A. In his Direct Testimony, Mr. Merante provided an analysis that demonstrates that $30 million in savings have been passed on to MAWC customers as a result of the use of AWCC financing as compared with accessing the private placement bond market.[45] In addition, in Figure 6, I show the debt issuances made through AWCC over the past 13 years, including the date of the issuance and the interest rate on the issuance. In addition, I have calculated the 30-day average yield on the Moody's A-rated Utility Bond Index and the Moody's Baa-rated Utility Bond index as of the date of each debt issuance. As shown in Figure 6, the interest rate obtained by AWCC has almost always been lower than the yield on the Moody's Utility Bond Index that corresponds to the AWCC rating at the time of issuance. This demonstrates that issuing debt through AWCC has consistently been the lowest cost resource available to American Water subsidiaries, including MAWC. Therefore, Missouri ratepayers have benefitted from the availability of the AWCC financing option, as opposed to MAWC obtaining financing on the open market.

[45] Merante DT, p. 13.

Figure 6: Comparison of Interest Rates on AWCC Debt Issuances and Applicable Moody's Utility Bond Index at Time of Issuance



Q. Is there a mismatch between Staff's and OPC's capital structure proposals and their respective proposals to rely on a proxy group to determine the authorized ROE?

A. Yes. While Mr. Jennings and Mr. Murray propose that the equity ratio for MAWC match the consolidated capital structure of American Water, they also rely on market-based data for a proxy group of comparable companies to estimate the cost of equity. The market-based data for the proxy group includes the capitalization of those companies. Therefore, the cost of equity that is estimated is related to the equity ratios of the proxy companies.

As discussed in my Direct Testimony, the *Hope* and *Bluefield* decisions form the basis for determining whether a return is just and reasonable.[46] One of the standards established by

[46] Bulkley DT, p. 9.

the United States Supreme Court in those cases is that the authorized return must be consistent with the returns for other companies with similar or comparable risk. Unless the authorized equity ratio in this case is comparable to the equity ratio of the proxy group, the ROE will be out of sync, and the *Hope* test will be violated because it requires that the authorized ROE be based on "comparable risk."

The risk factors that are considered for purposes of establishing "comparable risk" are the business risk, financial risk (leverage), and regulatory risk of the subject company to the proxy group:

- The use of proxy group companies in similar businesses establishes comparable business risk.
- The comparability of financial risk is evaluated by comparing the leverage of the subject company (*i.e.*, MAWC) to the proxy group. If the proxy group has lower financial risk (leverage) than the risk reflected by the equity ratio for the subject company, the cost of equity that results from the proxy group analysis must be adjusted to reflect the incremental risk of the subject company.
- Finally, regulatory risk is somewhat less certain across proxy companies. In this instance, the proxy group companies are more like American Water in that the regulatory risk is diversified across multiple jurisdictions.

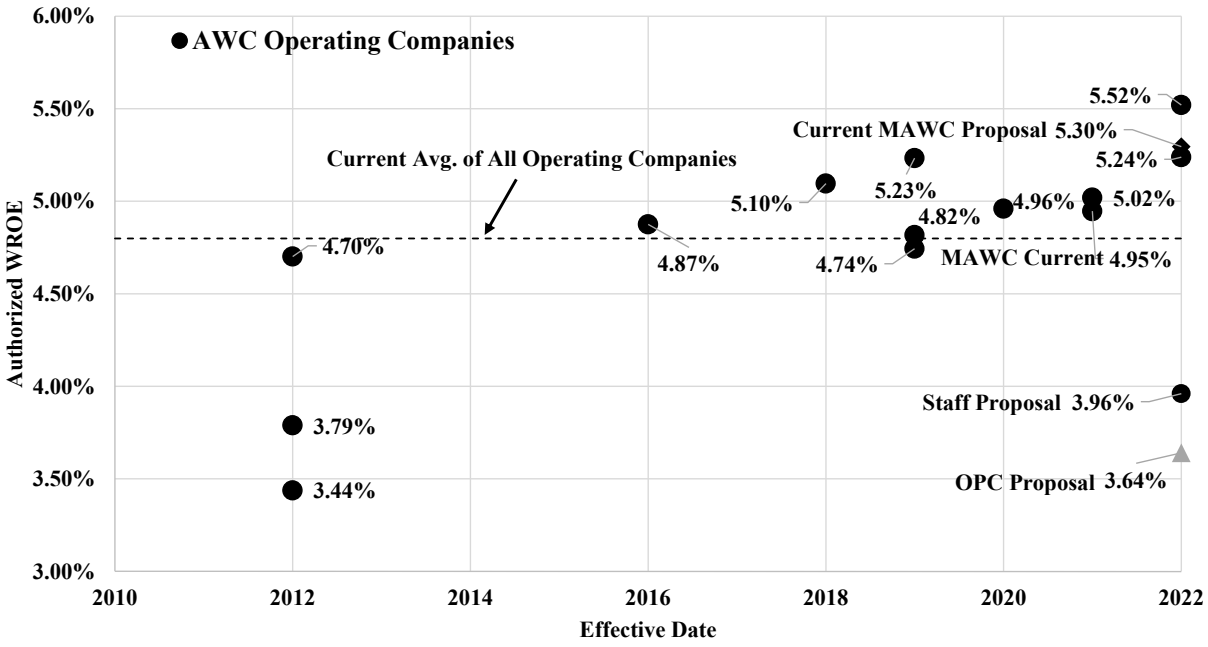
Consequently, use of American Water's consolidated capital structure, which is more highly leveraged than the capital structures of the proxy companies, would result in increased financial risk for MAWC that would need to be accounted for through an authorized ROE that is higher than what is indicated by the proxy company analysis.

Q. How do Mr. Jennings's or Mr. Murray's proposed equity ratios in combination with their proposed ROEs for MAWC compare to the other American Water utility operating subsidiaries?

A. Staff's proposed equity ratio of 40.71 percent and its recommended ROE of 9.73 percent produces a weighted equity return ("WROE") of just 3.96 percent. Mr. Murray's proposed

equity ratio of 40.45 percent and his recommended ROE of 9.00 percent produces a WROE of just 3.64 percent. The mean authorized ROE for the American Water operating subsidiaries is 9.70 percent and the mean equity ratio is 49.47 percent, which, as shown in Figure 7, produces a mean WROE of 4.80 percent. Thus, the weighted equity returns for MAWC proposed by Staff and OPC are substantially below the mean WROE of American Water's other operating companies.

Figure 7: Authorized Weighted Cost of Equity for American Water's Regulated Water Utility Subsidiaries[47]



[47] Short term debt is included in the capital structure for KY, IL, TN, VA, WV. The capital structure for TN includes portion for company and parent. IN includes deferred taxes in the capital structure, which have been removed for comparison purposes. MAWC current is based on 51.80% equity and 9.55% ROE.

Q. Does financial theory require aligning the equity ratio for ratemaking purposes to the equity ratio used to determine the authorized ROE?

A. Yes. If the Commission accepts Staff's or OPC's proposal to impute a capital structure consisting of more debt than the Company's test year capital structure, the higher common equity cost rate related to a changed common equity ratio must also be reflected in establishing the authorized ROE. It is a fundamental tenet of finance that the greater the amount of financial risk borne by common shareholders, the greater the return required by shareholders in order to be compensated for the added financial risk imparted by the greater use of senior debt financing. In other words, the greater the debt ratio, the greater the return required by equity investors. Thus, in that circumstance, the cost of equity must be adjusted to reflect the additional risk associated with the more debt-heavy capital structure. In fact, Mr. Murray acknowledges this relationship considering that he has stated that if the Commission authorizes a higher equity ratio than his recommendation, then he recommends that MAWC be authorized a lower ROE.[48]

Q. If the equity ratios recommended by Mr. Jennings and Mr. Murray were implemented, would the ROEs that they have recommended have to be significantly higher in order to achieve the equity return based on the current ROE and MAWC's current equity ratio?

A. Yes. As shown in Figure 8, if Staff's and OPC's proposed equity ratios were implemented, their ROEs for MAWC would need to be 11.74 percent and 11.82 percent, respectively, in order to achieve the same average WROE as MAWC has at a 50 percent equity ratio and

[48] Murray DT, p. 6.

an ROE of 9.55 percent. While Mr. Murray states that his recommended ROE should be lower if the Commission does not accept his proposed equity ratio proposal for MAWC, ironically he fails to acknowledge that his recommended equity ratio in combination with his recommended ROE in this proceeding is well below the average for American Water's regulated water utility subsidiaries, highlighting a disconnect with Mr. Murray's and Mr. Jennings's proposals.

Figure 8: Staff and OPC Proposed WROE v. MAWC WROE

	MAWC	Staff	OPC
Staff & OPC As Proposed			
Equity Ratio	50.00%	40.71%	40.45%
Equity Cost	9.55%	9.73%	9.00%
WROE	4.78%	3.96%	3.64%
Staff & OPC As Adjusted			
Equity Ratio		40.71%	40.45%
Equity Cost		11.74%	11.82%
WROE		4.78%	4.78%

Q. What is your conclusion regarding the capital structures recommended by Staff and OPC?

A. The use of the American Water consolidated capital structure recommended by Staff and OPC is not reflective of the way MAWC is actually operated, is contrary to the precedent of the United States Supreme Court and the Commission when considered in combination with their respective recommended ROEs, and is incompatible with financial theory.

VI. REBUTTAL OF COST OF EQUITY ISSUES

Q. Please summarize the cost of equity analyses of Mr. Jennings and Mr. Murray.

A. Mr. Jennings conducts a "comparative cost of equity analysis" to derive his recommended ROE for MAWC.[49] Specifically, Mr. Jennings estimates the cost of equity for MAWC as of 2Q/2022 and 1Q/2021 (*i.e.*, the time of the 2021 Spire Case) using a DCF and a CAPM, calculates the average results of those models as of each period, and then applies that difference to the 9.37 percent ROE that was authorized in the 2021 Spire Case.[50] In addition, Mr. Jennings also calculates the average authorized ROE for US water utilities and for natural gas utilities in 2021, and concludes that water utilities on average had authorized ROEs that were 10 basis points lower. Therefore, Mr. Jennings's recommended ROE reflects the result of his comparative ROE analysis, which is the sum of: (1) his calculated change in the cost of equity for MAWC between Q1/2021 and Q2/2022; (2) his calculated difference in national average authorized ROEs for water versus natural gas utilities in 2021; and (3) the Commission's authorized ROE in the 2021 Spire Case. Mr. Jennings also calculates a "rule of thumb" bond yield plus risk premium analysis as a reasonableness check on the results of his DCF and CAPM analyses.[51]

Mr. Murray develops several multi-stage DCF and CAPM analyses, as well as a "rule of thumb" bond yield plus risk premium approach similar to Mr. Jennings.[52] Instead of averaging or otherwise aggregating these cost of equity estimates in a systematic fashion,

---

[49] Jennings DT, p. 2.

[50] *Id.*, Schedule RTJ-d15.

[51] *Id.*, at 34-35.

[52] Murray DT, p. 8.

Mr. Murray recommends a starting point for a "zone of reasonableness standard"[53] to define the range within which MAWC's ROE should be established and, within that range, his recommended ROE. Mr. Murray also states that his recommended ROE of 9.00 percent is contingent on the Commission establishing MAWC's equity ratio consistent with its parent's target equity ratio of approximately 40 percent, and that if the Commission authorizes a higher equity ratio, then Mr. Murray recommends that MAWC be authorized an ROE of 8.40 percent.[54]

Q. Are Mr. Jennings's and Mr. Murray's ROE recommendations for MAWC based on their respective cost of equity analyses?

A. No. Figure 9 summarizes the results of the cost of equity estimation approaches used by these witnesses and their final recommendations. As shown, the results of Mr. Jennings's cost of equity analyses are not relied on for his recommended ROE, since the results of his DCF and CAPM analyses are well below his recommended ROE. Rather, as noted, Mr. Jennings only relies on the results of these models as a comparison to the results from those same models as of the end of Q1/2021. Considering Mr. Jennings's recommended ROE for MAWC is approximately 180 to 230 basis points higher than the results of his DCF and CAPM analyses, respectively, it is clear that the results of Mr. Jennings's DCF and CAPM analyses are not representative of a fair and reasonable return for MAWC.

---

[53] *Id.*, at 4.

[54] *Id.*, at 6.

Figure 9: Summary of Staff and OPC Cost of Equity Estimation Methodologies

	Staff Jennings	OPC Murray
DCF Q2 2022	7.934%[55]	6.22%[56]
CAPM Q2 2022	7.44%[57]	7.53% - 8.46%[58]
Rule of Thumb (BYRP)	7.46% - 9.97%[59]	8.75% - 9.00%[60]
Range	N/A	8.40%-9.25%[61]
Recommendation	9.73%[62]	9.00%[63]

Likewise, Mr. Murray has also not relied on the results of his cost of equity models to establish either the range within which MAWC's ROE should fall, nor his recommended ROE for the Company, considering that the results of his DCF and CAPM analyses are also well below his recommended ROE. Mr. Murray claims that he considers the Commission's "zone of reasonableness," which the Commission has defined as extending from 100 basis points above and 100 basis points below the recent national average authorized ROE for water, electric and/or gas utilities,[64] to establish his recommended ROE range, and he recommends that the Commission use an allowed ROE of 9.40 percent as

[55] Jennings DT, p. 32.

[56] Murray DT, p. 34.

[57] Jennings DT, p. 34.

[58] Murray DT, p. 37.

[59] Jennings DT, p. 34.

[60] Murray DT, p. 38.

[61] *Id*., at 39.

[62] Jennings DT, p. 36.

[63] Murray DT, p. 39.

[64] *See, e.g*., Missouri Public Service Commission, Report and Order, Case No. GR-2009-0355, February 10, 2010, at 36.

the starting point in this proceeding for the "zone of reasonableness." In other words, Mr. Murray implies a "zone of reasonableness" of 8.40 percent to 10.40 percent; however, without explanation, he arbitrarily recommends a ROE range for MAWC that reflects only a range of 85 basis points within the low end of the "zone of reasonableness." In other words, Mr. Murray arbitrarily truncates his "zone of reasonableness" upon which he bases his ROE range for the Company and entirely disregards the upper half of his recommended "zone of reasonableness."

Q. Before addressing the specific inputs of Mr. Jennings's cost of equity analyses, are there any overarching issues with Staff's "comparative" cost of equity approach to establish MAWC's ROE in this proceeding?

A. Yes. There are numerous elements of Mr. Jennings's cost of equity analyses with which I disagree, and these specific input and methodology issues with which I disagree are discussed in detail later in this section. However, the most critical issue with Mr. Jennings's comparative analysis is that it utilizes the 2021 Spire Case as a benchmark for setting MAWC's ROE, yet it fails to account for any differences between the operations of Spire and MAWC.

For example, Mr. Jennings is proposing that MAWC's equity ratio be set at 40.71 percent, which reflects the parent company consolidated capital structure. However, in the 2021 Spire Case, the utility's stand-alone capital structure of 54.25 percent equity was used for ratemaking purposes. In other words, Staff is proposing materially different leverage in the capital structure for MAWC relative to what was authorized in the 2021 Spire Case, and this is a significant risk factor that would otherwise change the credit metrics for MAWC in accessing the market on its own and would result in greater risk to equity

holders. While Mr. Jennings attempts to account for a difference between natural gas and water utilities by comparing differences in nationally authorized ROEs for these utilities, he fails to account for other differences that should be reflected in the ROE (*e.g.*, the significant difference in capital structure; differences in other risk factors).

The comparative approach implemented by Mr. Jennings requires adjustments that are unnecessary if the cost of equity analyses are conducted on the subject company and are reasonably specified based on current and expected market conditions. Deriving an estimated cost of equity from several analytical approaches based on current and expected market data is a widely-used and defensible approach to recommending a reasonable ROE for ratemaking purposes. While I disagree with Mr. Jennings's comparative approach, even if one were to conduct such an approach, all necessary adjustments would need to be made to account for the differences between the subject and the benchmark company; however, Mr. Jennings has not done that.

Q. While you disagree with Mr. Jennings's comparative analysis, does it rely on the most current data available?

A. No. Inexplicably, Mr. Jennings's cost of equity analyses rely on data for the quarter ending June 2022 even though he filed his testimony in late November 2022.

Q. Have you updated Mr. Jennings's analyses to reflect the most current data?

A. Yes. I have updated Mr. Jennings's "current" DCF and CAPM analyses (*i.e.*, those for 2Q/2022) based on the three months ended November 30, 2022. In order to isolate the impact of failing to reflect current data, I have only updated the data used in Mr. Jennings's analyses through November 2022 and have retained all of his methodologies and

assumptions. These updated analyses are shown on Schedules AEB-R-10 through AEB-R-12.

Q. What are the results of Mr. Jennings's analyses when updated with data through October 2022?

A. As shown on Schedules AEB-R-10 through AEB-R-12, when Mr. Jennings's comparative cost of equity analysis is updated to reflect data through November 2022, and everything else remains the same, his analysis results in a "Water Utility Adjustment" of 117 basis points (not 46 basis points). In other words, when the *only* change that is made to Mr. Jennings's comparative cost of equity analyses is to update those analyses to reflect the most current data, his ROE recommendation would be just 6 basis points different than my ROE recommendation for the Company in this proceeding.

Q. As you noted previously, Mr. Jennings also reduces his ROE recommendation by 10 basis points to reflect what he suggests is the difference between national average authorized water utility ROEs and national average authorized natural gas utility ROEs in 2021. Is there any basis for this adjustment?

A. No, for multiple reasons, there is no basis for Mr. Jennings's proposed adjustment. As shown on Schedule RTJ-d17, Mr. Jennings concludes that the average nationally authorized ROE for water utilities in 2021 was 10 basis points less than the average for

natural gas distribution utilities.[65] However, the authorized ROE data on which Mr. Jennings bases his conclusion does not support his adjustment.

First, Mr. Jennings indicates on Schedule RTJ-d17 that his adjustment is based on data from 10 water utility proceedings in 2021 and 43 natural gas distribution proceedings. However, what Mr. Jennings fails to disclose is that there was an authorized ROE specified in only 4 of the 10 water proceedings. As shown in Figure 10, the authorized ROE in three of those cases ranged between 9.52 percent and 9.60 percent, and there was a single case in which the authorized ROE was 9.00 percent. Consequently, Mr. Jennings's analysis suffers from a bias of a small sample size and it is not reasonable to draw a conclusion for comparative purposes on the basis of only four authorized water utility ROEs. In comparison, there were 43 natural gas utility rate case proceedings in 2021 in which an authorized ROE was specified.

[65] Mr. Jennings states that the average authorized ROE for natural gas utilities in 2021 was 9.56 percent, while the average authorized ROE for water utilities in 2021 was 9.46 percent, which suggests supports a 10 basis point reduction in his comparative-based ROE recommendation.

Figure 10: Water Utility Rate Proceedings in 2021 and the Authorized ROE, if Specified

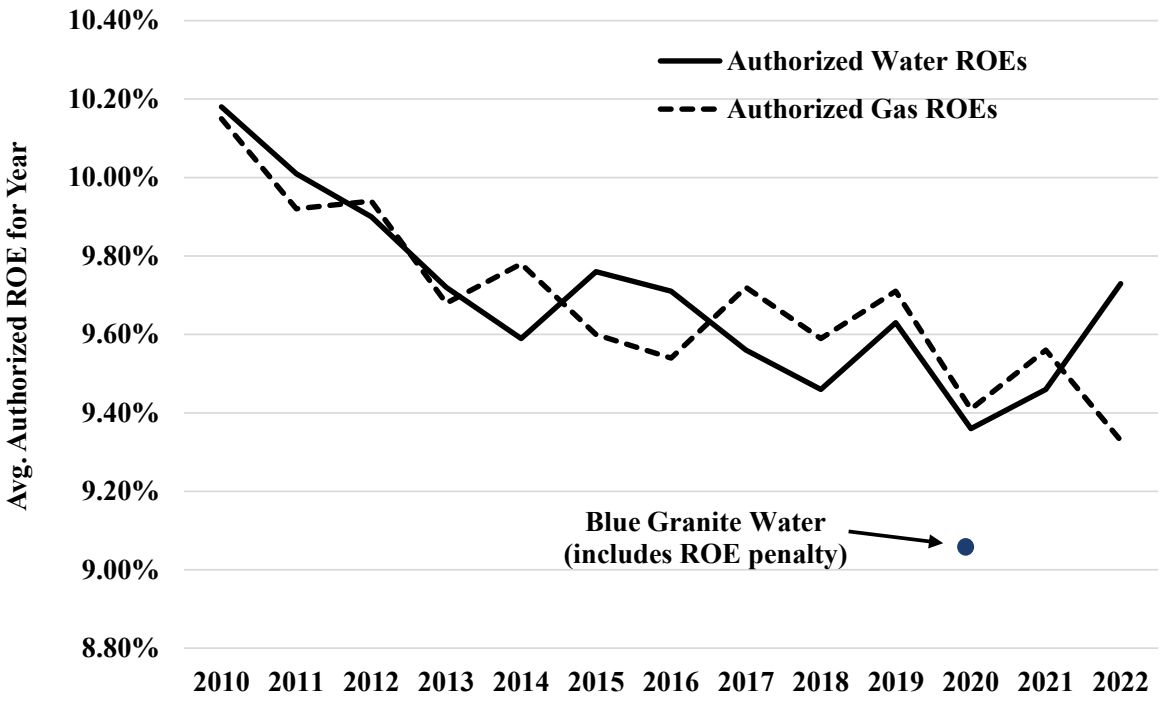
Jurisdiction	Company	Docket No.	Order Date	Decision Type	Authorized ROE
Pennsylvania	Pennsylvania American Water Co.	R-2020-3019369, *et. al.*	02/25/21	Settled	NA
Missouri	Missouri American Water Co.	WR-2020-0344, *et. al.*	04/07/21	Settled	NA
Idaho	Veolia Water Idaho	SUZ-W-20-02	04/30/21	Settled	NA
New Jersey	Veolia Water New Jersey	D-WR20110729	05/19/21	Settled	9.60%
Iowa	Iowa American Water	RPU-2020-0001	06/28/21	Litigated	9.60%
Virginia	Aqua Virginia Inc.	PUR-2020-00106	06/22/21	Settled	NA
Connecticut	Connecticut Water Co.	20-12-30	07/28/21	Litigated	9.00%
California	California American Water Co.	A-19-07-004	12/30/21	Settled	NA
Illinois	Utility Services of Illinois Inc.	21-0198	12/31/21	Litigated	9.52%
				Average	9.43%
				Median	9.56%

Second, Mr. Jennings relies on an average of the ROEs authorized in those four utility rate cases in 2021; however, as noted, three of the four authorized ROEs are between 9.52 percent and 9.60 percent, while the authorized ROE in the other proceeding is much lower at 9.00 percent. While it is *not* reasonable to draw a conclusion from such a small sample size of just four rate proceedings, even for the sake of argument if one were to utilize such data, the median of the results should have been relied on as the measure of central tendency considering one of the results was so much different than the other three results. As shown in Figure 10, the median result of those four proceedings is 9.56 percent. In comparison, based on Mr. Jennings's workpapers, the median result of the authorized ROEs for the natural gas utilities in 2021 was 9.60 percent – thus, a much smaller difference than 10 basis points assuming such a comparison were correct, which as discussed, it is not.

Lastly, Mr. Jennings's proposed 10 basis point adjustment attempts to determine a relative comparison in the cost of equity between water and natural gas utilities at the time of the

2021 Spire Case; however, not only is his analysis biased by a small sample size for the water utilities, but it also is biased by relying on a very short period of time (*i.e.*, a single year of 2021. While I have not attempted to verify the data in Mr. Jennings's Schedule RTJ-d17, as shown in Figure 11, strictly using the authorized ROE data in Schedule RTJ-d17 demonstrates that authorized ROEs for water and natural gas utilities have varied relative to one another over time. Considering that the number of authorized ROEs for water utilities in a single year can be limited – such as it was in 2021 for Mr. Jennings's analysis – it is not reasonable to draw a conclusion regarding the relationship between authorized ROEs for water and natural gas utilities from a single year of data.

Figure 11: Authorized ROEs for Water and Natural Gas Utilities, 2010 through July 2022[66]



Q. Turning to Mr. Murray's ROE recommendation, in addition to the fact that his cost of equity estimates are well below his ROE recommendation, do you have any other overarching concerns regarding Mr. Murray's recommended ROE for MAWC?

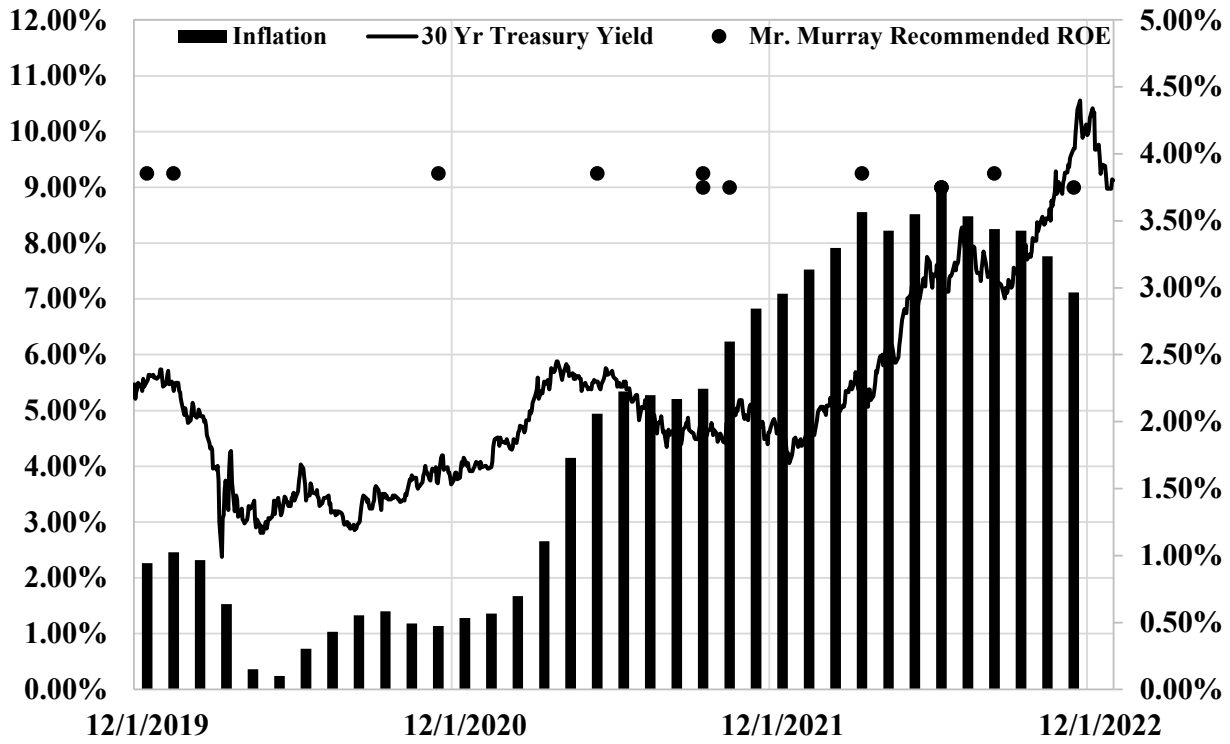
A. Yes. As recently highlighted in Spire Missouri Inc.'s most recent rate case,[67] and as shown in Figure 12, Mr. Murray has consistently recommended an ROE of 9.00 percent to 9.25 percent, regardless of market conditions, since 2019. In addition, Mr. Murray has

[66] Schedule RTJ-d17 indicates that the average authorized water ROE for 2020 is 9.04%; however, that average is based on the authorized ROE in only 6 proceedings, one of which was an authorized ROE for Blue Granite Water, which included an unspecified penalty for poor performance. As such, the blue dot on the graph is the 9.04 percent average for 2020 reflected in Mr. Jennings's Schedule RTJ-d17; however, the line on the graph is the average for 2020 excluding the result for Blue Granite Water.

[67] Missouri Public Service Commission, Case No. GR-2022-0179, Rebuttal Testimony of Adam Woodard, October 7, 2022, Schedule AWW-R1.

recommended an equity ratio no higher than 48.00 percent in any of these cases either. Given Mr. Murray's cost of equity estimates for MAWC are below any authorized ROE in the last 40 years, and his apparent disregard for changing capital market conditions in his recommended ROE, this demonstrates that Mr. Murray's ROE recommendations are highly arbitrary.

Figure 12: Mr. Murray Recommended ROE Relative to 30-Year Treasury Bond Yields



A. Proxy Group

Q. Please summarize the composition of Staff and OPC's proxy groups.

A. Both Mr. Jennings and Mr. Murray rely on a small proxy group that is composed solely of water utilities. The difference between the two proxy groups is that Mr. Jennings includes Middlesex Water Company in his proxy group for purposes of the DCF analysis, while Mr. Murray excludes them from his multi-stage DCF analysis. Both Mr. Jennings and Mr.

Murray include Middlesex Water Company in their proxy group for their respective CAPM analyses. In addition, both Mr. Jennings and Mr. Murray include MAWC's parent company, American Water, in their proxy groups for both the DCF and CAPM analyses.

Q. What are your concerns with the proxy group relied upon by Mr. Murray?

A. The proxy group relied upon by these witnesses is very small and includes the parent company of MAWC. As discussed in my direct testimony, I exclude the parent company from the proxy group due to the circularity that may result from relying on the parent company since the market valuation of that entity could be affected by the outcome of this proceeding.[68] Further, I believe that the proxy group relied upon by these witnesses is unnecessarily small and could be improved by the inclusion of both natural gas utilities and Eversource Energy, which is an electric and natural gas distribution utility that also owns substantial water utility operations.

Q. Does the use of the water-only proxy group materially affect the results of your cost of equity analyses?

A. No. As discussed previously regarding my updated cost of equity estimation models, regardless of whether the combined water/natural gas proxy group or the water-only proxy group is used and reflects data through November 30, 2022, the results are similar, and slightly higher for the water-only proxy group.

---

[68] Bulkley DT, p. 35.

B. DCF Analysis

Q. Please summarize the DCF analyses prepared by Mr. Jennings.

A. Mr. Jennings conducts a constant growth DCF model that relies on a projected dividend yield for his proxy group companies and an average of (1) analysts' projected earnings per share ("EPS"), dividends per share ("DPS") and book value per share ("BVPS") growth rates; and (2) a projected nominal GDP growth rate.[69] He calculates this model for two different time periods, using the average of the high and low stock prices for the three month period ending June 30, 2022 and for the three month period ending March 31, 2021 (*i.e.*, the time period of the 2021 Spire Case). The cost of equity results of these comparative DCF analyses are 7.93 percent and 8.05 percent, respectively.

Q. Please summarize the DCF analyses prepared by Mr. Murray.

A. Mr. Murray conducts a multi-stage DCF model that includes three stages, the first two of which have defined time horizons (4 and 11 years, respectively), while the third assumes cash flows in perpetuity. In the first stage (*i.e.*, 2023 to 2026), Mr. Murray relies on analyst estimates of annual DPS and EPS.[70] From the first stage, an annualized growth rate of DPS and EPS is derived for each company in the proxy group. His second stage models an equal percentage change in the dividend payout ratio from the end of the first stage until the terminal year (*i.e.*, year 15), at which point Mr. Murray assumes a payout ratio that retains sufficient earnings to ensure each company in his group maintains a perpetual

---

[69] Jennings DT, p. 31.

[70] With the exception of SJW Group, which only had estimates available through to 2025.

growth rate at three different levels – 3.70 percent, 4.00 percent and 4.30 percent.[71] Mr. Murray contends his long-term growth rate is consistent with the potential long-term sustainable growth rate of the U.S. economy, water utility fundamentals, and commentary/analysis from institutional investors/analysts. Based on a mid-point long-term growth rate of 4.00 percent, Mr. Murray's multi-stage DCF analysis produces an average cost of equity estimate of 6.22 percent.

Q. Setting aside the overarching issues you raised previously regarding Mr. Jennings's "comparative" cost of equity analysis, are the DCF model results produced by either Mr. Jennings or Mr. Murray reasonable?

A. No. As a threshold matter, despite recognizing that interest rates have increased 150 basis points from 1Q/2021 to 2Q/2022,[72] and concluding that the cost of equity for MAWC has increased since the 2021 Spire Case, Mr. Jennings's DCF results suggest the exact opposite,[73] meaning the results of Mr. Jennings' DCF analysis are nonsensical. Moreover, the results of both Mr. Jennings's and Mr. Murray's DCF analyses are unreasonably low, do not reflect MAWC's cost of equity, and do not provide any meaningful information for the Commission.[74] Their respective DCF results are all well below any authorized ROE for a utility in the last 40 years. The only jurisdiction that has authorized an ROE as low as the results of Mr. Jennings's DCF model is South Carolina in 2020; however, that

---

71 Murray DT, p. 30.

72 Jennings DT, p. 18.

73 *Id*, at Schedule RTJ-d13.

74 Specifically, the results of Mr. Jennings's two-step DCF model indicates a cost of equity of 7.93 percent as of the end of June 2022, and Mr. Murray's multi-stage DCF indicates a cost of equity in a range from 6.09 percent to 6.35 percent depending on the long-term growth rate used.

decision for Blue Granite Water of a 7.46 percent ROE reflected an unspecified penalty for poor service performance. Thus, not only was the amount of the penalty unspecified in that case, the circumstances are also not applicable to MAWC either. The *Hope* and *Bluefield* decisions, which both witnesses acknowledges are standards to be upheld, require the authorized return to be just and reasonable, as well as comparable to other returns available to investors in companies with similar risk. Both Mr. Jennings's and Mr. Murray's DCF results clearly violate this standard.

Q. Do you agree with the approach that Mr. Jennings has used for the growth rate in his DCF analysis?

No. As noted, the growth rate that Mr. Jennings has used in his DCF analysis is a weighted average of (1) an average of analysts' projected EPS, DPS and BVPS growth rates ("Step 1 growth rate"); and (2) a projected GDP growth rate ("Step 2 growth rate"), and he states that his growth rate is consistent with the two-step approach outlined by the Federal Energy Regulatory Commission ("FERC") in its Opinion No. 569.[75] However, Mr. Jennings's methodology is not consistent with FERC's ROE methodology. Specifically, for the Step 1 growth rate, the FERC relies solely on projected EPS growth rates and does not rely on either projected DPS or projected BVPS growth rates. In addition, there are also other differences between Mr. Jennings's DCF analysis and FERC's methodology:

- The FERC has consistently relied on earnings growth rates from I/B/E/S (which are the same as those reported on Yahoo! Finance), not *Value Line*, as Mr. Jennings has used in his DCF analysis.

[75] Jennings DT, p. 31.

- The FERC relies on six months of high and low stock prices for the proxy group companies to compute the dividend yield, not the three months of stock price data that Mr. Jennings has relied upon.

Q. Why is it more appropriate to rely on EPS growth rates than DPS growth rates?

A. EPS growth rates are more appropriate to use in the DCF model because dividend growth ultimately can only be sustained by earnings growth. As noted by Brigham and Houston:

> Growth in dividends occurs primarily as a result of growth in earnings per share (EPS). Earnings growth, in turn, results from a number of factors, including (1) inflation, (2) the amount of earnings the company retains and invests, and (3) the rate of return the company earns on its equity (ROE).[76]

Further, changes in a company's dividend payments are based on management decisions related to cash management and other factors. Forty S&P 500 companies suspended dividend payments in 2020 as a result of the increased uncertainty due to COVID-19.[77] These dividend suspensions occurred because companies believed earnings over the short term would decline and, therefore, elected to conserve cash to offset the financial effects of COVID-19. These decisions affect the dividends and the payout ratio in the short term but are not necessarily indicative of a firm's long-term earnings growth. Therefore, dividend growth rates are less likely than earnings growth rates to reflect investor perceptions of a company's growth prospects.

Moreover, investment analysts report predominant reliance on EPS growth projections. In a survey completed by 297 members of the Association for Investment Management and

---

[76] Eugene F. Brigham and Joel F. Houston, *Fundamentals of Financial Management*, at 317 (Concise Fourth Edition, Thomson South-Western, 2004).

[77] Karen Langley, *U.S. Companies Slashed Dividends at Fastest Pace in More Than a Decade*, Wall Street Journal, July 8, 2020.

Research, the majority of respondents ranked earnings as the most important variable in valuing a security (more important than cash flow, dividends, or book value).[78]

Q. Is there academic support for the use of EPS growth rates in the DCF model?

A. Yes, there is substantial academic research that supports the use of EPS growth estimates in the DCF model.[79]

Q. While Mr. Murray's ROE recommendation for MAWC does not rely on the results of his multi-stage DCF analysis, do you agree with his specification of the model and the result produced by that model?

A. No. There are two primary problems with Mr. Murray's multi-stage DCF. First, while Mr. Murray uses current water utility stock prices for calculating future dividends of the proxy group companies, he has failed to account for the fact that equity analysts view water utility stock prices as overvalued and are expecting their stock prices to decline. As water utility stock prices decline going forward, in the case of Mr. Murray's multi-stage DCF, the amount needed to be paid by an investor to capture the benefit of future dividends declines, thereby increasing the cost of equity. In other words, by failing to account for expected lower water utility stock prices going forward, Mr. Murray's multi-stage DCF model understates the cost of equity.

---

[78] Stanley B. Block, *A Study of Financial Analysts: Practice and Theory*, Financial Analysts Journal (July/August 1999).

[79] *See, e.g.*, Jing Liu, *et al*., *Equity Valuation Using Multiples*, Journal of Accounting Research, Vol. 40 No. 1, March 2002; C.A. Gleason, *et al*., *Valuation Model Use and the Price Target Performance of Sell-Side Equity Analysts*, Contemporary Accounting Research; Boochun Jung, *et. al*., *Do financial analysts' long-term growth forecasts matter? Evidence from stock recommendations and career outcomes*, Journal of Accounting and Economics, Vol. 53 Issues 1-2, February-April 2012.

Second, Mr. Murray relies on a long-term EPS growth rate of 4.00 percent in his multi-stage DCF model; however, this is inconsistent with equity analysts' expectation of future EPS growth for water utilities, and is also contradictory of his own expectation of long-term growth for the industry. Therefore, Mr. Murray's long-term EPS growth rate in his multi-stage DCF also understates the cost of equity.

Q. What are equity analysts' current recommendations regarding water utility stocks given current valuations?

A. While equity analysts have indicated that they expect water utilities to sustain EPS growth rate projections over the long-term, there is concern over the current valuations of those utilities, with many recommending "hold" or "sell" for water utility stocks. For example:

- **
-
-

[80] **
**

[81] **
**

[82] **

- Overall, Zacks ranks the water utility industry in the bottom 28 percent of all industries covered (*i.e.*, 178 out of 248).[83]

As shown in Figure 13, Zacks' recommends all of the water utilities in Mr. Murray's proxy group as either "sell" or "hold," with all of the those utilities having a "value" rating of either "D" or "F" (which is based on a rating from "A" to "F" such as grading in school), meaning that all of the water utilities are expensively priced. This highlights that, while equity analysts expect robust EPS growth over the long-term term for the water utility industry, the earnings growth is not sufficient to support the current high stock price valuations, and water utility valuations are expected to decline to levels more in line with what can be supported by projected long-term earnings growth.

Figure 13: Zacks' Ranking of Mr. Murray's Water Utility Proxy Group

			Zacks Style Scores Value Growth Momentum ("VGM")			
Company	Ticker	Zacks Rank	Value	Growth	Momentum	Overall VGM
American States Water Co.	AWR	Sell	F	C	B	D
American Water Works Co. Inc.	AWK	Hold	D	D	C	D
California Water Service Group	CWT	Sell	D	B	A	C
Essential Utilities, Inc.	WTRG	Sell	F	C	B	D
SJW Group	SJW	Hold	D	B	A	B
Middlesex Water Co.	MSEX	Sell	F	C	B	F

[82] **

**

[83] Zacks Investment Research; https://www.zacks.com/stocks/industry-rank/industry/utility-water-supply-196.

Q. Mr. Murray suggests that the Company has not provided analyst reports that are freely exchanged among the investment community. What is your response?

A. I disagree with Mr. Murray's characterization that analyst reports are "freely exchanged". Equity analyst reports routinely include copyright provisions that make clear that the contents of the reports are the analysts' intellectual property and that the data may not be copied or redistributed. In fact, several of the reports that were provided in the confidential attachments to MoPSC 0056, the data request that Mr. Murray references, have such disclosures. It is my understanding that the Company requested authorization from the equity analysts to provide this historical information and that certain analysts (as recently as January 2023) have continued to deny the Company the rights to produce these reports.

Q. Why do you disagree with the long-term growth rate used in Mr. Murray's multi-stage DCF?

A. Mr. Murray's long-term growth rate assumption of 4.00 percent is inconsistent with the water utility stock prices that he relies on to specify his multi-stage DCF model. Mr. Murray cannot have it both ways, as there is a mismatch between assuming relatively high stock prices and a relatively low long-term growth rate. As just noted, the high water utility stock prices relied on by Mr. Murray are only sustainable if long-term EPS growth is also relatively high – not the low long-term growth rate assumed by Mr. Murray. Looking at it in a different way, the only way to maintain the current high stock price valuations with a low long-term growth rate is to assume an extremely low cost of equity, which is what Mr. Murray has done, but that is inconsistent with the market's expectation of water utility stock prices. Instead, if Mr. Murray were to assume a long-term growth rate more

consistent with current earnings growth projections, he would have obtained a much higher ROE estimate.

Q. Has Mr. Murray acknowledged that long-term EPS growth for the water utility industry could be robust and significantly higher than his assumed 4.00 percent?

A. Yes. In addition to equity analysts expecting strong future EPS growth, Mr. Murray also acknowledges that part of the reason for the higher valuations of water utilities particularly relative to electric and natural gas companies is the expectation that water utilities will sustain current earnings growth rates for the foreseeable future:

> However, another contributing factor to the water utility industry's higher valuation ratios is the widely recognized need for significant growth in net investment for the foreseeable future. *Consequently, many water utilities are expected to experience significant EPS growth over at least the next five years, if not longer*. Among its peers, American Water has one of the highest expected long-term compound annual growth rates ("CAGR") in EPS of 7% to 9%, primarily driven by an expected CAGR in rate base of 8% to 9%.[84]

If equity analysts were to expect the long-term EPS growth rate for water utilities to decline to 4.0 percent such as assumed by Mr. Murray, then they would undoubtedly have stock price targets for the proxy group much lower than the relatively high current stock prices upon which Mr. Murray relies for his DCF analysis.

[84] Murray DT, p. 2-3.

Q. What specification of the DCF model do you believe is most appropriate for estimating the cost of equity for MAWC?

A. A Constant Growth DCF model is appropriate for the utility industry because utilities are considered a mature industry as a result of their regulated status and relatively stable demand. Thus, financial projections such as earnings growth rates are also likely to be relatively stable over the long-term. This is consistent with the views of equity analysts, as well as Mr. Murray, that project water utilities will be able to sustain earnings growth projections over the long-term. Thus, Mr. Murray should have considered the Constant Growth form of the DCF model, which would have reflected long-term growth rates that more closely support the share prices he relies on to calculate his multi-stage DCF analysis. However, the Constant Growth DCF model, which relies on current stock price valuations, still understates the forward-looking cost of equity during the period that MAWC's rates will be in effect because utility valuations are expected to decline over the near-term, but to a much lesser degree than the multi-stage DCF model as specified by Mr. Murray.

C. CAPM

Q. Please summarize Mr. Jennings's application of the CAPM.

A. Mr. Jennings's CAPM analysis uses a risk-free rate based on the average yield on the 30-year Treasury bond for Q2/2022 and Q1/2021, *Value Line* betas for the water utility proxy group as of each of these time periods, and four measures of the market risk premium ("MRP") also as of each of these time periods. Specifically, for his MRP estimates, the market returns reflect (1) the long-term geometric mean of the historical return difference between large company stocks and long-term government bonds from 1926-2021; (2) the long-term arithmetic mean of the historical return difference between large company stocks

and long-term government bonds from 1926-2021; (3) the long-term geometric mean of the historical return difference between the S&P 500 and long-term government bonds from 1928-2021; and (4) the long-term arithmetic mean of the historical return difference between the S&P 500 and long-term government bonds from 1926-2021.

The results of Mr. Jennings's CAPM analyses range from 5.08 percent to 8.17 percent, with an average of 6.40 percent for Q1/202, while the results range from 6.04 percent to 9.42 percent, with an average of 7.44 percent, for Q2/2022. As a result, the incremental difference for Mr. Jennings's "comparative" CAPM analysis between Q1/2021 and Q2/2022 is 1.03 percent.[85]

Q. Please summarize Mr. Murray's application of the CAPM.

A. Mr. Murray develops three specifications of the CAPM analysis, with only the risk-free rate varying between the analyses. Specifically, risk-free rate in Mr. Murray's first CAPM analysis reflects the three-month average yield on the 20-year U.S. Treasury bond (*i.e.*, 3.82 percent), the second reflects the three-month average yield on the 30-year U.S. Treasury bond (*i.e.*, 3.58 percent), and the third reflects the current *Kroll* Normalized Risk-free Rate as of October 2022 (*i.e.*, 3.82 percent). Each of Mr. Murray's CAPM analyses rely on raw betas calculated from a template provided by S&P Market Intelligence based on the *Value Line* approach and then Mr. Murray adjusts the raw betas using the Blume formula. Each of Mr. Murray's CAPM analyses rely on a MRP of 6.00 percent, although Mr. Murray suggests that the MRP in the first two CAPM analyses reflects

[85] Jennings DT, Schedule RTJ-d14.

"consideration of historical achieved earned return spreads and risk premiums market risk premiums typical of those recommended by various authoritative sources," while the MRP in the third CAPM analysis is based on the MRP published by *Kroll* as of October 2022.[86]

Q. Do you agree with the CAPM analyses conducted by Mr. Jennings and Mr. Murray?

A. No. Beyond the fact that the results of their respective CAPM analyses do not support their recommended ROEs for MAWC, as I discussed earlier with respect to his DCF analysis, a significant and overarching problem with Mr. Jennings's CAPM analysis is that he relies on data only through 2Q/2022, which is outdated and does not reflect current market conditions. For example, the 30-day average Treasury bond yield as of November 30, 2022 is 4.07 percent, which is over 100 basis points higher than the risk-free rate relied upon by Mr. Jennings through Q2 2022. Furthermore, the MRPs relied upon by Mr. Jennings and Mr. Murray are not reasonable.

Q. Why is Mr. Jennings's use of the historical MRPs unreasonable?

A. There are multiple reasons why the historical MRPs relied upon by Mr. Jennings are unreasonable. First, in addition to the arithmetic mean, Mr. Jennings has incorrectly relied on the geometric mean to calculate the risk premium. Second, Mr. Jennings has incorrectly used the total return on long-term government bonds to calculate his historical market risk premium instead of the income-only return on long-term government bonds. Third, Mr. Jennings's historical market risk premium fails to consider the inverse relationship between

[86] Murray DT, Schedules DM-D-7 through 9.

interest rates and the market risk premium under current market conditions (*i.e.*, as interest rates decrease, the market risk premium increases).

Q. Why is it inappropriate to consider a geometric mean to calculate a historical return?

A. Geometric and arithmetic means are used for different purposes. The geometric mean is the compound rate that equates a beginning value to its ending value. It is used to determine the exact rate of compounded return between a specific starting and ending point. The arithmetic mean, which is the appropriate calculation in this circumstance, is the simple average of single period rates of return and best approximates the uncertainty associated with returns from year to year. The important distinction between the two methods is that the arithmetic mean assumes that each periodic return is an independent observation and, therefore, incorporates uncertainty into the calculation of the long-term average. In contrast, the geometric mean does not incorporate the same degree of uncertainty because it assumes that returns remain constant from year to year.

In his review of literature on the topic, Cooper noted the following rationale for using the arithmetic mean:

> Note that the arithmetic mean, not the geometric mean is the relevant value for this purpose. The quantity desired is the rate of return that investors expect over the next year for the random annual rate of return on the market. The arithmetic mean, or simple average, is the unbiased measure of the expected value of repeated observations of a random variable, not the geometric mean.…[The] geometric mean underestimates the expected annual rate of return.[87]

Furthermore, Pratt and Grabowski note the following in their review of the literature:

> The choice between which average to use is a matter of disagreement among practitioners. The arithmetic average receives the most support in the

[87] Cooper, Ian, *Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting*, European Financial Management 2.2, (1996): 158.

> literature, though other authors recommend a geometric average. The use of the arithmetic average relies on the assumption that (1) market returns are serially independent (not correlated) and (2) the distribution of market returns is stable (not time-varying). Under these assumptions, an arithmetic average gives an unbiased estimate of expected future returns assuming expected conditions in the future are similar to conditions during the observation period. Moreover, the more observations available, the more accurate will be the estimate.[88]

Q. Why do you disagree with Mr. Jennings's calculation of the historical MRP?

A. Mr. Jennings has calculated his market risk premia in one instance as the difference between the long-term average return on large company stocks and the long-term average *total* return on long-term government bonds, and in the other instance as the difference between the long-term average total return on the S&P 500 and the long-term average *total* return on Treasury bonds. However, in calculating a historical market risk premium, the long-term average *income-only* return should be deducted from the long-term average return on large company stocks or the S&P 500, not the *total* return (*i.e*., income return and inflation) on long-term government bonds.

As stated by Morningstar, which is the former publisher of the historical dataset relied on by Mr. Jennings for his historical market risk premia that is now published by *Kroll*, the historical market risk premium is appropriately calculated by subtracting the *income-only* portion of the government bond return from the total return on large company stocks:

> Another point to keep in mind when calculating the equity risk premium is that the income return on the appropriate-horizon Treasury security, rather than the total return, is used in the calculation. The total return is comprised of three return components: the income return, the capital appreciation return, and the reinvestment return…The income return is thus used in the

---

[88] Pratt, Shannon P., and Grabowski, Roger J., *Cost of Capital: Applications and Examples*. Wiley, 2008, at 96.

estimation of the equity risk premium because it represents the truly riskless portion of the return.[89]

Q. Beyond the fact that a historical MRP would be appropriately calculated using the income-only return, not the total return, on long-term government bonds, is there also evidence generally that the use of a historical MRP may not be appropriate?

A. Yes. While Mr. Jennings's use of the average total return of large company stocks and the S&P 500 from 1926 through 2021 is reflective of the returns realized by investors under different market and economic conditions since 1926, it is not necessarily reflective of the market return required by investors in the current and expected market environment. As discussed previously, interest rates have increased significantly and are expected to continue to remain relatively high as compared to the recent past for at least the next year as the Federal Reserve continues to normalize monetary policy to combat inflation. Furthermore, there is added uncertainty in the market regarding the pace and effect of the Federal Reserve's policy normalization on the economy and inflation. Recently, investors have responded to both positive and negative developments regarding the effect of inflation, the effect of the Federal Reserve's policy on the economy, and the global economic effects of the war in Ukraine. The increased uncertainty means that the overall risk in the market has increased. The effect of current market conditions on investor return requirements are muted in a long-term average historical return calculation and therefore do not specifically reflect the current market risk premium. The inputs and assumptions used in the CAPM analysis should reflect the expectations of the market at that time. By

[89] Morningstar, Ibbotson SBBI 2012 Valuation Yearbook, Market Results for Stocks, Bonds, Bills, and Inflation 1926-2011, at 55.

relying on long-term historical averages that smooth out numerous business cycles, Mr. Jennings's market returns fail to capture projected market conditions during the period in which the Company's rates will be in effect and arbitrarily understate the market return in the near-term.

Q. Is there also evidence that the use of a historical MRP can produce counter-intuitive results?

A. Yes. Figure 14 illustrates the problem with relying on a historical market risk premium. Specifically, the figure shows that from 2007-2009, the historical market risk premium decreased even as market volatility (the primary statistical measure of risk) significantly increased. Further, this figure demonstrates the significant swings in the annual equity risk premium that were averaged into the long-term historical average calculations relied on by Mr. Jennings. As shown, in 2008, the annual equity "premium" was negative, which implies a discount. It is incomprehensible that the perceived risk to equity holders was negative (implying a lower required return for equity holders versus debt holders) in the height of the financial market collapse when the overall market return was a negative 37 percent. As shown in Figure 14, this individual observation, which runs counter to the theory of the equity risk premium, reduced the average market risk premium for the prior 80 years by 60 basis points.

Figure 14: Historical Market Risk Premium and Market Volatility

	Market Volatility	Market Return	Annual Equity Premium	Long-term Average Historical Market Risk Premium[90]
2009	31.48	26.46%	3.47%	**6.70%**
2008	32.69	-37.00%	-41.45%	**6.50%**
2007	17.54	5.49%	0.63%	**7.10%**

The assumption that investors would expect or require a lower risk premium during periods of increased volatility is counter-intuitive and leads to unreliable analytical results. The relevant issue in the application of the CAPM is to ensure that all three components of the model (*i.e.*, the risk-free rate, beta, and the MRP) are consistent with market conditions and investor perceptions. As shown in Figure 14, the use of a historical market risk premium can result in a lower market risk premium during periods of increased risk aversion, which is at odds with that premise. However, the use of forecasted market risk premium estimates as used in my CAPM analysis specifically address that concern.

Q. Does Mr. Jennings's use of historical market risk premia also fail to consider the inverse relationship between interest rates and the market risk premium?

A. Yes. There are a number of studies that have shown that the MRP is inversely related to the level of interest rates.[91] Therefore, adding a risk premium based on a historical average interest rate level to current bond yields (*i.e.*, A-rated and Baa-rated utility bonds in the

[90] Morningstar Inc., 2008 Ibbotson Stocks, Bonds, Bills, and Inflation, Valuation Yearbook, at 28. Morningstar Inc., 2009 Ibbotson Stocks, Bonds, Bills, and Inflation, Valuation Yearbook, at 23. Morningstar Inc., 2010 Ibbotson Stocks, Bonds, Bills, and Inflation, Valuation Yearbook, at 23. Historical Market Risk Premium equals total return on large company stocks less income only return on long-term government securities.

[91] *See, e.g.*, S. Keith Berry, *Interest Rate Risk and Utility Risk Premia during 1982-93*, Managerial and Decision Economics, Vol. 19, No. 2 (March, 1998), at 7; Robert S. Harris, *Using Analysts' Growth Forecasts to Estimate Shareholders Required Rates of Return*, Financial Management, Spring 1986, at 66.

case of Mr. Jennings and American Water's bonds in the case of Mr. Murray) that are below historical averages, understates the current cost of equity for MAWC. Given that the current yields on Treasury bonds are lower than the historical average, and the inverse relationship between interest rates and the MRP, Mr. Jennings's use of historical market risk premia understates the MRP in the current market environment.

For example, the historical income-only return on government bonds over the period 1926 to 2021 has been approximately 4.87 percent,[92] while the 30-day average risk-free rate on long-term government bonds as of November 30, 2022 is 4.07 percent. Therefore, because current interest rates on long-term government bonds are well below the historical average, the inverse relationship between interest rates and the market risk premium implies that the current market risk premium should be well *above* the long-term historical average market risk premium, which is 7.46 percent as shown on Schedule AEB-R-13 – not well *below* the long-term historical average such as estimated by Mr. Jennings's market risk premia that range from 4.61 percent to 6.71 percent. Consequently, Mr. Jennings's use of a historical MRP also understates the MRP in the current market environment.

Q. Does Mr. Murray's MRP suffer from similar issues that you have identified by Mr. Jennings's MRPs?

A. Yes. Mr. Murray states that he also considers the historical geometric mean and historical arithmetic mean equity risk premia from 1926 to 2021 published by *Kroll* just as Mr. Jennings has done.[93] As I just discussed with regard to Mr. Jennings, these historical

---

[92] *Kroll*, Valuation Handbook: Guide to Cost of Capital, 2022.

[93] Murray DT, p. 36.

market risk premia are not appropriate and understate the MRP in the current market conditions.

Q. Do you have any other concerns with the MRP of 6.0 percent relied on by Mr. Murray?

A. Yes. First, Mr. Murray assumed a MRP of 6.0 percent in MAWC's prior rate case when he filed his testimony in November 2020. However, as shown previously in Figure 12, capital market conditions are substantially different currently than they were in November 2020, yet Mr. Murray has relied on the same MRP for his CAPM analysis.

Second, as shown in Figure 15, the implied market returns for the MRP cited by Mr. Murray range from 9.58 percent to 9.82 percent, which is substantially below the recent historical returns for large company stocks that Mr. Murray states that he also considers in establishing his MRP.

Figure 15: Mr. Murray's Implied Market Returns [94]

Description	Amount	Source
Murray CAPM 1		
MRP	6.00%	Historical/Equity Analyst
Risk-Free Rate	3.82%	20-Year Treasury bond yield
Implied Market Return	9.82%	
Murray CAPM 2		
MRP	6.00%	Historical/Equity Analyst
Risk-Free Rate	3.58%	30-Year Treasury bond yield
Implied Market Return	9.58%	
Murray CAPM 3		
MRP	6.00%	Kroll Recommended
Risk-Free Rate	3.82%	Kroll Normalized
Implied Market Return	9.82%	

As shown in Figure 16, the actual average market return for large company stocks from 2009 to 2021 (*i.e.*, the period from the Great Recession of 2008/09 to current) was 16.55 percent as reported by *Kroll*. Therefore, the implied market returns considered by Mr. Murray are well below and cannot be reconciled with recent returns for the market.

[94] Murray DT, Schedules DM-D-7 through 9.

Figure 16: Total Return for Large Company Stocks, 2009-2021[95]

Year	Total Return
2009	26.46%
2010	15.06%
2011	2.11%
2012	16.00%
2013	32.39%
2014	13.69%
2015	1.38%
2016	11.96%
2017	21.83%
2018	-4.38%
2019	31.49%
2020	18.40%
2021	28.70%
Average	**16.55%**

Q. Mr. Murray also suggests that the MRP on which he relies for his CAPM is consistent with the equity risk premium American Water uses for its own internal valuation purposes.[96] Do you agree with this assessment?

A. No. While Mr. Murray cites a Goodwill Impairment Evaluation ("Impairment Report") prepared in November 2019 as the basis for his support for a 6.00 percent MRP, there are several reasons why I do not agree that it is supportive or should be relied upon for purposes of his assumed MRP in this proceeding.

First, ratemaking and the estimation of the cost of equity are both forward looking. The Impairment Report is based on data and assumptions as of mid-2019, which provides no

[95] *Kroll*, Cost of Capital Navigator.

[96] Murray DT, p. 36.

meaningful information on which to set the cost of capital on a forward-looking basis in the current proceeding. As previously discussed, capital market conditions are substantially different today than they were three and half years ago, and thus the inputs to the GIE's CAPM analysis would be different than they would be currently. Mr. Murray provides no basis as to why historical analyses are relevant to the current and projected period at issue in this proceeding.[97]

Second, the CAPM analysis that is relied on in the Impairment Report is inconsistent with Mr. Murray's own application of the CAPM in this proceeding. As noted in the Impairment Report, the equity risk premium was calculated using data published by Duff & Phelps (which is now *Kroll*) and included a small company risk premium. In addition, the equity risk premium in the Impairment Report also included an unsystematic risk premium. However, Mr. Murray's equity risk premium based on similar information currently published by *Kroll* does not discuss nor include either a small company risk premium or an unsystematic risk premium. Therefore, individual assumptions used in the CAPM prepared in the Impairment Report cannot be used to validate Mr. Murray's CAPM analysis when the methodologies are entirely different.

For these reasons, there is no basis for Mr. Murray to suggest that the equity risk premium cited in the 2019 Impairment Report can reasonably be relied upon for forward-looking ratemaking or the forward-looking determination of the cost of equity. Further, it is not reasonable for Mr. Murray to suggest that one assumption from an analysis three and half

---

[97] As noted in the Company's response to DR OPC 3019, the Company relies on qualitative impairment testing annually to determine whether or not there is a need to conduct quantitative analyses. The 2019 Impairment Report is the most recent quantitative impairment analysis available.

years ago is supportive of his analysis in this proceeding, particularly when there are numerous other assumptions in the analysis that are inconsistent with Mr. Murray's assumptions to his current CAPM analysis.

Q. Have you recalculated a CAPM based on a water utility-only proxy group such as used by Mr. Jennings and Mr. Murray, but to correct the issues that you have identified with their respective analyses?

A. Yes. As shown in Schedule AEB-R-4, I have calculated a CAPM analysis that is based solely on a water utility proxy group, current data as of November 30, 2022, relies on both current and projected risk-free rates, and relies on a projected, not historical, market return and thus MRP. As shown, the results range from 10.31 percent to 10.70 percent.

D. "Rule of Thumb" Approach

Q. Please summarize the "rule of thumb" approach utilized by Mr. Jennings and Mr. Murray.

A. The "rule of thumb" methodology presented by Mr. Jennings and Mr. Murray is a form of the risk premium methodology that simply adds an estimated equity risk premium to an average utility bond yield to estimate the cost of equity. Specifically, Mr. Jennings relies on the three-month average yield of Moody's A-rated and Baa-rated utility bonds through Q2/2022 of 4.64 percent and 4.97 percent, respectively, plus a generic market risk premium of between 3.00 to 5.00 percent, which he states results in a cost of equity range of 7.64 percent to 9.97 percent.[98] Similarly, Mr. Murray relies on the current yield to maturity of

[98] Jennings DT, p. 34.

American Water's publicly traded bonds of 5.75 percent to 6.0 percent plus a generic market risk premium between 3.00 percent and 4.00 percent. However, Mr. Murray selects only the low-end of his generic risk premium range of 3.00 percent because he contends that, since investors view utilities as bond "surrogates/substitutes," it is logical and reasonable to not add a premium above 3.00 percent.[99] Mr. Murray states that his "rule of thumb" approach results in a cost of equity of 8.75 percent to 9.00 percent.[100] Both witnesses suggest that their "rule of thumb" results support their respective cost of equity model results.[101]

Q. Do you agree with this methodology?

A. No. First, while both Mr. Jennings and Mr. Murray characterize their approaches as a "rule of thumb," they utilize two different ranges for the generic MRP (*i.e.*, Mr. Jennings suggests it is 3.0 to 5.0 percent, while Mr. Murray suggests it is 3.0 to 4.0 percent). In addition, in MAWC's prior rate proceeding, ironically Staff stated that the generic MRP for the "rule of thumb" approach was 4.0 to 6.0 percent, or higher than Mr. Jennings uses in this proceeding. Clearly, there is no consensus as to their "rule of thumb," highlighting its arbitrary nature and it being overly simplistic.

The overly simplistic nature of this approach is highlighted by comparing Mr. Murray's "rule of thumb" result in MAWC's last rate proceeding to his result in this proceeding relative to his recommended ROEs in each case. Specifically, as shown in Figure 17, while

---

[99] Murray DT, p. 37.

[100] Murray DT, p. 37-38.

[101] Jennings DT, p. 34-35; Murray DT, pp. 37-38.

the result of Mr. Murray's "rule of thumb" approach has increased significantly from the prior case to this case, his recommended ROE range for MAWC is effectively unchanged.

Figure 17: Comparison of Mr. Murray's "Rule of Thumb" Results

	Mr. Murray "Rule of Thumb" Results	Mr. Murray ROE Recommendation
MAWC 2020 Rate Case	5.75%	8.25% to 9.25%
MAWC Current Rate Case	8.75% to 9.00%	8.40% to 9.25%

Second, while I agree that it is generally appropriate to rely on properly-specified risk premium methodologies, I do not agree with the simplistic approach that Mr. Jennings and Mr. Murray have utilized as a check on the reasonableness of the results of their other cost of equity estimation models. Both Mr. Jennings's and Mr. Murray's specification of the "rule of thumb" approach rely on a historical estimate of the MRP and do not take into consideration the inverse relationship between interest rates and the MRP as previously discussed. As such, this methodology is not reflective of investor return requirements over the rate period.

Q. Mr. Jennings states that his "rule of thumb" result supports his DCF and CAPM results.[102] Do you agree?

A. No. Mr. Jennings asserts that his "rule of thumb" range of 7.64 percent to 9.97 percent supports the average cost of equity estimate from his DCF and CAPM analyses of 7.68 percent. However, Mr. Jennings's average result of his DCF and CAPM models is at the

[102] Jennings DT, pp. 34-35.

very bottom of that range and he offers no explanation or support as to why that should be the case.

Q. Mr. Murray claims that the results of his "rule of thumb" analysis overstates the cost of equity for water utilities due to changes in dividend yields of water utilities.[103] Do you agree?

A. No. Mr. Murray states that his "rule of thumb" results imply that American Water's cost of equity has increased 300 basis points since MAWC's 2020 rate case; however, he then asserts that this is overstated due to changes in dividend yields since that prior rate case. Mr. Murray provides no evidence that supports such an assertion. As shown in Mr. Murray's own testimony, water utility dividend yields have remained in a fairly constant range of between 1.75 percent and 2.25 percent since MAWC's 2020 rate case.[104] Although Mr. Murray contends that the change over time in water utility dividend yields is a benchmark for the change in ROE, these variations are unrelated to his own "rule of thumb" method since, under Mr. Murray's "rule of thumb" method, only changes in bond yields are relevant for assessing the cost of equity. Based on his own testimony, average long-term utility bond yields have risen to approximately 6.00 percent as of October 2022, which indicates a substantial increase in the cost of equity for MAWC since its 2020 rate case.[105]

---

[103] Murray DT, pp. 38-39.

[104] *Id*., at 38.

[105] *Id.*, at 10.

Q. Does this conclude your Rebuttal Testimony?

A. Yes, it does.

Summary of Cost of Equity Model Results

Combined Proxy Group

		Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Constant Growth DCF Mean	30-Day Average	9.03%	10.19%	11.54%
	90-Day Average	9.01%	10.17%	11.51%
	180-Day Average	8.98%	10.14%	11.49%
	Constant Growth Average	9.01%	10.17%	11.51%
Constant Growth DCF Median	30-Day Average	8.63%	10.03%	10.87%
	90-Day Average	8.64%	9.87%	10.81%
	180-Day Average	8.64%	9.84%	10.74%
	Constant Growth Average	8.64%	9.91%	10.80%

		Current 30-Day Avg 30-Yr Treasury Bond Yield	Near-Term Projected 30-Yr Treasury Bond Yield	Long-Term Projected 30-Yr Treasury Bond Yield
CAPM	Value Line Beta	11.03%	11.03%	11.00%
	Bloomberg Beta	10.69%	10.69%	10.66%
	Long-term Avg. Beta	10.30%	10.30%	10.25%
ECAPM	Value Line Beta	11.43%	11.43%	11.41%
	Bloomberg Beta	11.18%	11.18%	11.15%
	Long-term Avg. Beta	10.88%	10.88%	10.85%

Summary of Cost of Equity Model Results

Water Only Proxy Group

		Minimum Growth Rate	Average Growth Rate	Maximum Growth Rate
Constant Growth DCF Mean	30-Day Average	8.77%	10.48%	12.41%
	90-Day Average	8.82%	10.53%	12.45%
	180-Day Average	8.87%	10.58%	12.51%
	Constant Growth Average	8.82%	10.53%	12.46%
Constant Growth DCF Median	30-Day Average	8.21%	10.29%	12.69%
	90-Day Average	8.25%	10.21%	12.60%
	180-Day Average	8.32%	10.21%	12.60%
	Constant Growth Average	8.26%	10.23%	12.63%

		Current 30-Day Avg 30-Yr Treasury Bond Yield	Near-Term Projected 30-Yr Treasury Bond Yield	Long-Term Projected 30-Yr Treasury Bond Yield
CAPM	Value Line Beta	10.58%	10.58%	10.54%
	Bloomberg Beta	10.60%	10.60%	10.56%
	Long-term Avg. Beta	10.27%	10.27%	10.22%
ECAPM	Value Line Beta	10.71%	10.71%	10.67%
	Bloomberg Beta	11.18%	11.18%	11.16%
	Long-term Avg. Beta	10.82%	10.82%	10.78%

30-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$2.96	$108.61	2.73%	2.83%	7.50%	8.16%	7.50%	7.72%	10.33%	10.55%	11.00%
New Jersey Resources Corporation	NJR	$1.56	$45.37	3.44%	3.54%	5.00%	6.00%	6.00%	5.67%	8.52%	9.20%	9.54%
NiSource Inc.	NI	$0.94	$25.75	3.65%	3.79%	9.50%	6.35%	6.80%	7.55%	10.12%	11.34%	13.32%
Northwest Natural Gas Company	NWN	$1.94	$47.30	4.10%	4.20%	6.50%	4.30%	4.30%	5.03%	8.49%	9.24%	10.73%
ONE Gas, Inc.	OGS	$2.48	$79.92	3.10%	3.19%	6.50%	5.00%	5.00%	5.50%	8.18%	8.69%	9.70%
Spire, Inc.	SR	$2.74	$69.59	3.94%	4.08%	9.00%	8.00%	5.00%	7.33%	9.04%	11.41%	13.11%
Eversource Energy	ES	$2.55	$77.40	3.29%	3.40%	6.50%	6.42%	6.20%	6.37%	9.60%	9.77%	9.90%
American States Water Company	AWR	$1.59	$91.18	1.74%	1.79%	5.50%	4.40%	n/a	4.95%	6.18%	6.74%	7.29%
California Water Service Group	CWT	$1.00	$60.49	1.65%	1.73%	6.50%	11.70%	n/a	9.10%	8.21%	10.83%	13.45%
SJW Group	SJW	$1.44	$69.98	2.06%	2.18%	14.00%	9.80%	n/a	11.90%	11.96%	14.08%	16.20%
Essential Utilities, Inc.	WTRG	$1.15	$44.89	2.56%	2.65%	10.00%	6.80%	6.10%	7.63%	8.74%	10.29%	12.69%
Middlesex Water Company	MSEX	$1.16	$81.97	1.42%	1.44%	4.50%	2.70%	n/a	3.60%	4.13%	5.04%	5.95%
Mean										8.62%	9.77%	11.07%
Mean (excluding Middlesex)										9.03%	10.19%	11.54%
Median										8.63%	10.03%	10.87%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

90-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$2.96	$110.61	2.68%	2.78%	7.50%	8.16%	7.50%	7.72%	10.28%	10.50%	10.95%
New Jersey Resources Corporation	NJR	$1.56	$44.19	3.53%	3.63%	5.00%	6.00%	6.00%	5.67%	8.62%	9.30%	9.64%
NiSource Inc.	NI	$0.94	$27.60	3.41%	3.53%	9.50%	6.35%	6.80%	7.55%	9.86%	11.08%	13.07%
Northwest Natural Gas Company	NWN	$1.94	$48.02	4.04%	4.14%	6.50%	4.30%	4.30%	5.03%	8.43%	9.17%	10.67%
ONE Gas, Inc.	OGS	$2.48	$78.66	3.15%	3.24%	6.50%	5.00%	5.00%	5.50%	8.23%	8.74%	9.76%
Spire, Inc.	SR	$2.74	$69.65	3.93%	4.08%	9.00%	8.00%	5.00%	7.33%	9.03%	11.41%	13.11%
Eversource Energy	ES	$2.55	$83.37	3.06%	3.16%	6.50%	6.42%	6.20%	6.37%	9.35%	9.53%	9.66%
American States Water Company	AWR	$1.59	$86.93	1.83%	1.87%	5.50%	4.40%	n/a	4.95%	6.27%	6.82%	7.38%
California Water Service Group	CWT	$1.00	$58.97	1.70%	1.77%	6.50%	11.70%	n/a	9.10%	8.25%	10.87%	13.49%
SJW Group	SJW	$1.44	$65.83	2.19%	2.32%	14.00%	9.80%	n/a	11.90%	12.09%	14.22%	16.34%
Essential Utilities, Inc.	WTRG	$1.15	$46.30	2.48%	2.57%	10.00%	6.80%	6.10%	7.63%	8.65%	10.21%	12.60%
Middlesex Water Company	MSEX	$1.16	$87.48	1.33%	1.35%	4.50%	2.70%	n/a	3.60%	4.04%	4.95%	5.86%
Mean										8.59%	9.73%	11.04%
Mean (excluding Middlesex)										9.01%	10.17%	11.51%
Median										8.64%	9.87%	10.81%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

180-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
Atmos Energy Corporation	ATO	$2.96	$111.66	2.65%	2.75%	7.50%	8.16%	7.50%	7.72%	10.25%	10.47%	10.92%
New Jersey Resources Corporation	NJR	$1.56	$44.11	3.54%	3.64%	5.00%	6.00%	6.00%	5.67%	8.62%	9.30%	9.64%
NiSource Inc.	NI	$0.94	$28.53	3.29%	3.42%	9.50%	6.35%	6.80%	7.55%	9.75%	10.97%	12.95%
Northwest Natural Gas Company	NWN	$1.94	$49.45	3.92%	4.02%	6.50%	4.30%	4.30%	5.03%	8.31%	9.06%	10.55%
ONE Gas, Inc.	OGS	$2.48	$80.91	3.07%	3.15%	6.50%	5.00%	5.00%	5.50%	8.14%	8.65%	9.66%
Spire, Inc.	SR	$2.74	$71.05	3.86%	4.00%	9.00%	8.00%	5.00%	7.33%	8.95%	11.33%	13.03%
Eversource Energy	ES	$2.55	$84.97	3.00%	3.10%	6.50%	6.42%	6.20%	6.37%	9.29%	9.47%	9.60%
American States Water Company	AWR	$1.59	$83.84	1.90%	1.94%	5.50%	4.40%	n/a	4.95%	6.34%	6.89%	7.45%
California Water Service Group	CWT	$1.00	$56.66	1.76%	1.85%	6.50%	11.70%	n/a	9.10%	8.32%	10.95%	13.57%
SJW Group	SJW	$1.44	$63.96	2.25%	2.39%	14.00%	9.80%	n/a	11.90%	12.16%	14.29%	16.41%
Essential Utilities, Inc.	WTRG	$1.15	$46.28	2.48%	2.58%	10.00%	6.80%	6.10%	7.63%	8.66%	10.21%	12.60%
Middlesex Water Company	MSEX	$1.16	$90.46	1.28%	1.31%	4.50%	2.70%	n/a	3.60%	4.00%	4.91%	5.81%
Mean										8.57%	9.71%	11.02%
Mean (excluding Middlesex)										8.98%	10.14%	11.49%
Median										8.64%	9.84%	10.74%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

30-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
American States Water Company	AWR	$1.59	$91.18	1.74%	1.79%	5.50%	4.40%	n/a	4.95%	6.18%	6.74%	7.29%
California Water Service Group	CWT	$1.00	$60.49	1.65%	1.73%	6.50%	11.70%	n/a	9.10%	8.21%	10.83%	13.45%
SJW Group	SJW	$1.44	$69.98	2.06%	2.18%	14.00%	9.80%	n/a	11.90%	11.96%	14.08%	16.20%
Essential Utilities, Inc.	WTRG	$1.15	$44.89	2.56%	2.65%	10.00%	6.80%	6.10%	7.63%	8.74%	10.29%	12.69%
Middlesex Water Company	MSEX	$1.16	$81.97	1.42%	1.44%	4.50%	2.70%	n/a	3.60%	4.13%	5.04%	5.95%
Mean										7.84%	9.39%	11.12%
Mean (excluding Middlesex)										8.77%	10.48%	12.41%
Median										8.21%	10.29%	12.69%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 30-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

90-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
American States Water Company	AWR	$1.59	$86.93	1.83%	1.87%	5.50%	4.40%	n/a	4.95%	6.27%	6.82%	7.38%
California Water Service Group	CWT	$1.00	$58.97	1.70%	1.77%	6.50%	11.70%	n/a	9.10%	8.25%	10.87%	13.49%
SJW Group	SJW	$1.44	$65.83	2.19%	2.32%	14.00%	9.80%	n/a	11.90%	12.09%	14.22%	16.34%
Essential Utilities, Inc.	WTRG	$1.15	$46.30	2.48%	2.57%	10.00%	6.80%	6.10%	7.63%	8.65%	10.21%	12.60%
Middlesex Water Company	MSEX	$1.16	$87.48	1.33%	1.35%	4.50%	2.70%	n/a	3.60%	4.04%	4.95%	5.86%
Mean										7.86%	9.41%	11.13%
Mean (excluding Middlesex)										8.82%	10.53%	12.45%
Median										8.25%	10.21%	12.60%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 90-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

180-DAY CONSTANT GROWTH DCF

Company	Ticker	[1] Annualized Dividend	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Value Line Earnings Growth	[6] Yahoo! Finance Earnings Growth	[7] Zacks Earnings Growth	[8] Average Growth Rate	[9] Cost of Equity: Minimum Growth Rate	[10] Cost of Equity: Mean Growth Rate	[11] Cost of Equity: Maximum Growth Rate
American States Water Company	AWR	$1.59	$83.84	1.90%	1.94%	5.50%	4.40%	n/a	4.95%	6.34%	6.89%	7.45%
California Water Service Group	CWT	$1.00	$56.66	1.76%	1.85%	6.50%	11.70%	n/a	9.10%	8.32%	10.95%	13.57%
SJW Group	SJW	$1.44	$63.96	2.25%	2.39%	14.00%	9.80%	n/a	11.90%	12.16%	14.29%	16.41%
Essential Utilities, Inc.	WTRG	$1.15	$46.28	2.48%	2.58%	10.00%	6.80%	6.10%	7.63%	8.66%	10.21%	12.60%
Middlesex Water Company	MSEX	$1.16	$90.46	1.28%	1.31%	4.50%	2.70%	n/a	3.60%	4.00%	4.91%	5.81%
Mean										7.90%	9.45%	11.17%
Mean (excluding Middlesex)										8.87%	10.58%	12.51%
Median										8.32%	10.21%	12.60%

Notes:
[1] Bloomberg Professional
[2] Bloomberg Professional, equals 180-day average as of November 30, 2022
[3] Equals [1] / [2]
[4] Equals [3] x (1 + 0.50 x [8])
[5] Value Line
[6] Yahoo! Finance
[7] Zacks
[8] Equals Average ([5], [6], [7])
[9] Equals [3] x (1 + 0.50 x Minimum ([5], [6], [7]) + Minimum ([5], [6], [7])
[10] Equals [4] + [8]
[11] Equals [3] x (1 + 0.50 x Maximum ([5], [6], [7]) + Maximum ([5], [6], [7])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & VL BETA

$K = Rf + \beta\,(Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.07%	0.80	12.64%	8.57%	10.93%	11.35%
New Jersey Resources Corporation	NJR	4.07%	0.95	12.64%	8.57%	12.21%	12.32%
NiSource Inc.	NI	4.07%	0.85	12.64%	8.57%	11.35%	11.68%
Northwest Natural Gas Company	NWN	4.07%	0.80	12.64%	8.57%	10.93%	11.35%
ONE Gas, Inc.	OGS	4.07%	0.80	12.64%	8.57%	10.93%	11.35%
Spire, Inc.	SR	4.07%	0.85	12.64%	8.57%	11.35%	11.68%
Eversource Energy	ES	4.07%	0.90	12.64%	8.57%	11.78%	12.00%
American States Water Company	AWR	4.07%	0.65	12.64%	8.57%	9.64%	10.39%
California Water Service Group	CWT	4.07%	0.70	12.64%	8.57%	10.07%	10.71%
Middlesex Water Company	MSEX	4.07%	0.70	12.64%	8.57%	10.07%	10.71%
SJW Group	SJW	4.07%	0.80	12.64%	8.57%	10.93%	11.35%
Essential Utilities, Inc.	WTRG	4.07%	0.95	12.64%	8.57%	12.21%	12.32%
Mean						11.03%	11.43%
Median						10.93%	11.35%

Notes:
[1] Source: Bloomberg Professional 30-day average as of November 30, 2022
[2] Source: Value Line reports
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & VL BETA

$K = Rf + \beta\,(Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.06%	0.80	12.64%	8.58%	10.92%	11.35%
New Jersey Resources Corporation	NJR	4.06%	0.95	12.64%	8.58%	12.21%	12.32%
NiSource Inc.	NI	4.06%	0.85	12.64%	8.58%	11.35%	11.67%
Northwest Natural Gas Company	NWN	4.06%	0.80	12.64%	8.58%	10.92%	11.35%
ONE Gas, Inc.	OGS	4.06%	0.80	12.64%	8.58%	10.92%	11.35%
Spire, Inc.	SR	4.06%	0.85	12.64%	8.58%	11.35%	11.67%
Eversource Energy	ES	4.06%	0.90	12.64%	8.58%	11.78%	12.00%
American States Water Company	AWR	4.06%	0.65	12.64%	8.58%	9.64%	10.39%
California Water Service Group	CWT	4.06%	0.70	12.64%	8.58%	10.07%	10.71%
Middlesex Water Company	MSEX	4.06%	0.70	12.64%	8.58%	10.07%	10.71%
SJW Group	SJW	4.06%	0.80	12.64%	8.58%	10.92%	11.35%
Essential Utilities, Inc.	WTRG	4.06%	0.95	12.64%	8.58%	12.21%	12.32%
Mean						11.03%	11.43%
Median						10.92%	11.35%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 42, No. 11. December 2, 2022, at 2
[2] Source: Value Line reports
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & VL BETA

$K = Rf + \beta\,(Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	3.90%	0.80	12.64%	8.74%	10.89%	11.33%
New Jersey Resources Corporation	NJR	3.90%	0.95	12.64%	8.74%	12.20%	12.31%
NiSource Inc.	NI	3.90%	0.85	12.64%	8.74%	11.33%	11.66%
Northwest Natural Gas Company	NWN	3.90%	0.80	12.64%	8.74%	10.89%	11.33%
ONE Gas, Inc.	OGS	3.90%	0.80	12.64%	8.74%	10.89%	11.33%
Spire, Inc.	SR	3.90%	0.85	12.64%	8.74%	11.33%	11.66%
Eversource Energy	ES	3.90%	0.90	12.64%	8.74%	11.77%	11.98%
American States Water Company	AWR	3.90%	0.65	12.64%	8.74%	9.58%	10.35%
California Water Service Group	CWT	3.90%	0.70	12.64%	8.74%	10.02%	10.67%
Middlesex Water Company	MSEX	3.90%	0.70	12.64%	8.74%	10.02%	10.67%
SJW Group	SJW	3.90%	0.80	12.64%	8.74%	10.89%	11.33%
Essential Utilities, Inc.	WTRG	3.90%	0.95	12.64%	8.74%	12.20%	12.31%
Mean						11.00%	11.41%
Median						10.89%	11.33%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Source: Value Line reports
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.07%	0.77	12.64%	8.57%	10.65%	11.15%
New Jersey Resources Corporation	NJR	4.07%	0.81	12.64%	8.57%	11.01%	11.42%
NiSource Inc.	NI	4.07%	0.82	12.64%	8.57%	11.13%	11.51%
Northwest Natural Gas Company	NWN	4.07%	0.70	12.64%	8.57%	10.07%	10.72%
ONE Gas, Inc.	OGS	4.07%	0.79	12.64%	8.57%	10.83%	11.28%
Spire, Inc.	SR	4.07%	0.76	12.64%	8.57%	10.63%	11.13%
Eversource Energy	ES	4.07%	0.81	12.64%	8.57%	11.01%	11.42%
American States Water Company	AWR	4.07%	0.66	12.64%	8.57%	9.71%	10.44%
California Water Service Group	CWT	4.07%	0.69	12.64%	8.57%	10.01%	10.67%
Middlesex Water Company	MSEX	4.07%	0.77	12.64%	8.57%	10.70%	11.18%
SJW Group	SJW	4.07%	0.82	12.64%	8.57%	11.11%	11.49%
Essential Utilities, Inc.	WTRG	4.07%	0.86	12.64%	8.57%	11.46%	11.76%
Mean						10.69%	11.18%
Median						10.76%	11.23%

Notes:
[1] Source: Bloomberg Professional 30-day average as of November 30, 2022
[2] Source: Bloomberg Professional
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.06%	0.77	12.64%	8.58%	10.65%	11.15%
New Jersey Resources Corporation	NJR	4.06%	0.81	12.64%	8.58%	11.01%	11.42%
NiSource Inc.	NI	4.06%	0.82	12.64%	8.58%	11.13%	11.51%
Northwest Natural Gas Company	NWN	4.06%	0.70	12.64%	8.58%	10.07%	10.71%
ONE Gas, Inc.	OGS	4.06%	0.79	12.64%	8.58%	10.82%	11.28%
Spire, Inc.	SR	4.06%	0.76	12.64%	8.58%	10.62%	11.13%
Eversource Energy	ES	4.06%	0.81	12.64%	8.58%	11.01%	11.42%
American States Water Company	AWR	4.06%	0.66	12.64%	8.58%	9.71%	10.44%
California Water Service Group	CWT	4.06%	0.69	12.64%	8.58%	10.01%	10.67%
Middlesex Water Company	MSEX	4.06%	0.77	12.64%	8.58%	10.70%	11.18%
SJW Group	SJW	4.06%	0.82	12.64%	8.58%	11.11%	11.49%
Essential Utilities, Inc.	WTRG	4.06%	0.86	12.64%	8.58%	11.46%	11.76%
Mean						10.69%	11.18%
Median						10.76%	11.23%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 42, No. 11. December 2, 2022, at 2
[2] Source: Bloomberg Professional
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$K = Rf + \beta (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	3.90%	0.77	12.64%	8.74%	10.61%	11.12%
New Jersey Resources Corporation	NJR	3.90%	0.81	12.64%	8.74%	10.98%	11.39%
NiSource Inc.	NI	3.90%	0.82	12.64%	8.74%	11.10%	11.49%
Northwest Natural Gas Company	NWN	3.90%	0.70	12.64%	8.74%	10.02%	10.68%
ONE Gas, Inc.	OGS	3.90%	0.79	12.64%	8.74%	10.79%	11.25%
Spire, Inc.	SR	3.90%	0.76	12.64%	8.74%	10.59%	11.10%
Eversource Energy	ES	3.90%	0.81	12.64%	8.74%	10.98%	11.40%
American States Water Company	AWR	3.90%	0.66	12.64%	8.74%	9.66%	10.40%
California Water Service Group	CWT	3.90%	0.69	12.64%	8.74%	9.96%	10.63%
Middlesex Water Company	MSEX	3.90%	0.77	12.64%	8.74%	10.66%	11.16%
SJW Group	SJW	3.90%	0.82	12.64%	8.74%	11.08%	11.47%
Essential Utilities, Inc.	WTRG	3.90%	0.86	12.64%	8.74%	11.44%	11.74%
Mean						10.66%	11.15%
Median						10.73%	11.20%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Source: Bloomberg Professional
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.07%	0.73	12.64%	8.57%	10.35%	10.93%
New Jersey Resources Corporation	NJR	4.07%	0.81	12.64%	8.57%	10.97%	11.39%
NiSource Inc.	NI	4.07%	0.72	12.64%	8.57%	10.25%	10.85%
Northwest Natural Gas Company	NWN	4.07%	0.69	12.64%	8.57%	9.97%	10.64%
ONE Gas, Inc.	OGS	4.07%	0.72	12.64%	8.57%	10.21%	10.82%
Spire, Inc.	SR	4.07%	0.72	12.64%	8.57%	10.21%	10.82%
Eversource Energy	ES	4.07%	0.72	12.64%	8.57%	10.25%	10.85%
American States Water Company	AWR	4.07%	0.69	12.64%	8.57%	10.02%	10.68%
California Water Service Group	CWT	4.07%	0.71	12.64%	8.57%	10.12%	10.75%
Middlesex Water Company	MSEX	4.07%	0.72	12.64%	8.57%	10.21%	10.82%
SJW Group	SJW	4.07%	0.75	12.64%	8.57%	10.50%	11.03%
Essential Utilities, Inc.	WTRG	4.07%	0.75	12.64%	8.57%	10.50%	11.03%
Mean						10.30%	10.88%
Median						10.23%	10.83%

Notes:
[1] Source: Bloomberg Professional 30-day average as of November 30, 2022
[2] Source: Schedule AEB-R-6
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	4.06%	0.73	12.64%	8.58%	10.35%	10.92%
New Jersey Resources Corporation	NJR	4.06%	0.81	12.64%	8.58%	10.97%	11.39%
NiSource Inc.	NI	4.06%	0.72	12.64%	8.58%	10.25%	10.85%
Northwest Natural Gas Company	NWN	4.06%	0.69	12.64%	8.58%	9.97%	10.64%
ONE Gas, Inc.	OGS	4.06%	0.72	12.64%	8.58%	10.21%	10.82%
Spire, Inc.	SR	4.06%	0.72	12.64%	8.58%	10.21%	10.82%
Eversource Energy	ES	4.06%	0.72	12.64%	8.58%	10.25%	10.85%
American States Water Company	AWR	4.06%	0.69	12.64%	8.58%	10.02%	10.67%
California Water Service Group	CWT	4.06%	0.71	12.64%	8.58%	10.11%	10.75%
Middlesex Water Company	MSEX	4.06%	0.72	12.64%	8.58%	10.21%	10.82%
SJW Group	SJW	4.06%	0.75	12.64%	8.58%	10.49%	11.03%
Essential Utilities, Inc.	WTRG	4.06%	0.75	12.64%	8.58%	10.49%	11.03%
Mean						10.30%	10.88%
Median						10.23%	10.83%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 42, No. 11. December 2, 2022, at 2
[2] Source: Schedule AEB-R-6
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
Atmos Energy Corporation	ATO	3.90%	0.73	12.64%	8.74%	10.31%	10.89%
New Jersey Resources Corporation	NJR	3.90%	0.81	12.64%	8.74%	10.94%	11.37%
NiSource Inc.	NI	3.90%	0.72	12.64%	8.74%	10.21%	10.81%
Northwest Natural Gas Company	NWN	3.90%	0.69	12.64%	8.74%	9.92%	10.60%
ONE Gas, Inc.	OGS	3.90%	0.72	12.64%	8.74%	10.16%	10.78%
Spire, Inc.	SR	3.90%	0.72	12.64%	8.74%	10.16%	10.78%
Eversource Energy	ES	3.90%	0.72	12.64%	8.74%	10.21%	10.81%
American States Water Company	AWR	3.90%	0.69	12.64%	8.74%	9.97%	10.64%
California Water Service Group	CWT	3.90%	0.71	12.64%	8.74%	10.07%	10.71%
Middlesex Water Company	MSEX	3.90%	0.72	12.64%	8.74%	10.16%	10.78%
SJW Group	SJW	3.90%	0.75	12.64%	8.74%	10.45%	11.00%
Essential Utilities, Inc.	WTRG	3.90%	0.75	12.64%	8.74%	10.45%	11.00%
Mean						10.25%	10.85%
Median						10.18%	10.80%

Notes:
[1] Source: Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Source: Schedule AEB-R-6
[3] Source: Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & VL BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.07%	0.65	12.64%	8.57%	9.64%	10.39%
California Water Service Group	CWT	4.07%	0.70	12.64%	8.57%	10.07%	10.71%
Middlesex Water Company	MSEX	4.07%	0.70	12.64%	8.57%	10.07%	10.71%
SJW Group	SJW	4.07%	0.80	12.64%	8.57%	10.93%	11.35%
Essential Utilities, Inc	WTRG	4.07%	0.95	12.64%	8.57%	12.21%	12.32%
Mean						10.58%	11.10%
Median						10.07%	10.71%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2022
[2] Value Line reports
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & VL BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.06%	0.65	12.64%	8.58%	9.64%	10.39%
California Water Service Group	CWT	4.06%	0.70	12.64%	8.58%	10.07%	10.71%
Middlesex Water Company	MSEX	4.06%	0.70	12.64%	8.58%	10.07%	10.71%
SJW Group	SJW	4.06%	0.80	12.64%	8.58%	10.92%	11.35%
Essential Utilities, Inc	WTRG	4.06%	0.95	12.64%	8.58%	12.21%	12.32%
Mean						10.58%	11.10%
Median						10.07%	10.71%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 11. November 1, 2022, at 2
[2] Value Line reports
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & VL BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	3.90%	0.65	12.64%	8.74%	9.58%	10.35%
California Water Service Group	CWT	3.90%	0.70	12.64%	8.74%	10.02%	10.67%
Middlesex Water Company	MSEX	3.90%	0.70	12.64%	8.74%	10.02%	10.67%
SJW Group	SJW	3.90%	0.80	12.64%	8.74%	10.89%	11.33%
Essential Utilities, Inc	WTRG	3.90%	0.95	12.64%	8.74%	12.20%	12.31%
Mean						10.54%	11.07%
Median						10.02%	10.67%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Value Line reports
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & BLOOMBERG BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.07%	0.66	12.64%	8.57%	9.71%	10.44%
California Water Service Group	CWT	4.07%	0.69	12.64%	8.57%	10.01%	10.67%
Middlesex Water Company	MSEX	4.07%	0.77	12.64%	8.57%	10.70%	11.18%
SJW Group	SJW	4.07%	0.82	12.64%	8.57%	11.11%	11.49%
Essential Utilities, Inc	WTRG	4.07%	0.86	12.64%	8.57%	11.46%	11.76%
Mean						10.60%	11.11%
Median						10.70%	11.18%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2022
[2] Bloomberg Professional
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.06%	0.66	12.64%	8.58%	9.71%	10.44%
California Water Service Group	CWT	4.06%	0.69	12.64%	8.58%	10.01%	10.67%
Middlesex Water Company	MSEX	4.06%	0.77	12.64%	8.58%	10.70%	11.18%
SJW Group	SJW	4.06%	0.82	12.64%	8.58%	11.11%	11.49%
Essential Utilities, Inc	WTRG	4.06%	0.86	12.64%	8.58%	11.46%	11.76%
Mean						10.60%	11.11%
Median						10.70%	11.18%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 11. November 1, 2022, at 2
[2] Bloomberg Professional
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & BLOOMBERG BETA

$$K = Rf + \beta\,(Rm - Rf)$$
$$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	3.90%	0.66	12.64%	8.74%	9.66%	10.40%
California Water Service Group	CWT	3.90%	0.69	12.64%	8.74%	9.96%	10.63%
Middlesex Water Company	MSEX	3.90%	0.77	12.64%	8.74%	10.66%	11.16%
SJW Group	SJW	3.90%	0.82	12.64%	8.74%	11.08%	11.47%
Essential Utilities, Inc	WTRG	3.90%	0.86	12.64%	8.74%	11.44%	11.74%
Mean						10.56%	11.08%
Median						10.66%	11.16%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Bloomberg Professional
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
CURRENT RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$K = Rf + \beta\ (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Current 30-day average of 30-year U.S. Treasury bond yield	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.07%	0.69	12.64%	8.57%	10.02%	10.68%
California Water Service Group	CWT	4.07%	0.71	12.64%	8.57%	10.12%	10.75%
Middlesex Water Company	MSEX	4.07%	0.72	12.64%	8.57%	10.21%	10.82%
SJW Group	SJW	4.07%	0.75	12.64%	8.57%	10.50%	11.03%
Essential Utilities, Inc	WTRG	4.07%	0.75	12.64%	8.57%	10.50%	11.03%
Mean						10.27%	10.86%
Median						10.21%	10.82%

Notes:
[1] Bloomberg Professional 30-day average as of November 30, 2022
[2] Schedule AEB-R-6
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
NEAR-TERM PROJECTED RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$K = Rf + \beta\ (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Near-term projected 30-year U.S. Treasury bond yield (Q1 2023 - Q1 2024)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	4.06%	0.69	12.64%	8.58%	10.02%	10.67%
California Water Service Group	CWT	4.06%	0.71	12.64%	8.58%	10.11%	10.75%
Middlesex Water Company	MSEX	4.06%	0.72	12.64%	8.58%	10.21%	10.82%
SJW Group	SJW	4.06%	0.75	12.64%	8.58%	10.49%	11.03%
Essential Utilities, Inc	WTRG	4.06%	0.75	12.64%	8.58%	10.49%	11.03%
Mean						10.27%	10.86%
Median						10.21%	10.82%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 11. November 1, 2022, at 2
[2] Schedule AEB-R-6
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

CAPITAL ASSET PRICING MODEL
LONG-TERM PROJECTED RISK-FREE RATE & VALUE LINE LT AVERAGE BETA

$K = Rf + \beta\ (Rm - Rf)$
$K = Rf + 0.25 \times (Rm - Rf) + 0.75 \times \beta \times (Rm - Rf)$

		[1]	[2]	[3]	[4]	[5]	[6]
Company	Ticker	Projected 30-year U.S. Treasury bond yield (2024 - 2028)	Beta (β)	Market Return (Rm)	Market Risk Premium (Rm − Rf)	CAPM ROE	ECAPM ROE
American States Water Company	AWR	3.90%	0.69	12.64%	8.74%	9.97%	10.64%
California Water Service Group	CWT	3.90%	0.71	12.64%	8.74%	10.07%	10.71%
Middlesex Water Company	MSEX	3.90%	0.72	12.64%	8.74%	10.16%	10.78%
SJW Group	SJW	3.90%	0.75	12.64%	8.74%	10.45%	11.00%
Essential Utilities, Inc	WTRG	3.90%	0.75	12.64%	8.74%	10.45%	11.00%
Mean						10.22%	10.83%
Median						10.16%	10.78%

Notes:
[1] Blue Chip Financial Forecasts, Vol. 41, No. 12, December 2, 2022, at 14
[2] Schedule AEB-R-6
[3] Schedule AEB-R-7
[4] Equals [3] - [1]
[5] Equals [1] + [2] x [4]
[6] Equals [1] + 0.25 x ([4]) + 0.75 x ([2] x [4])

Historical Beta, 2013 - 2021

Company	Ticker	[1] 12/31/2013	[2] 12/31/2014	[3] 12/31/2015	[4] 12/31/2016	[5] 12/31/2017	[6] 12/31/2018	[7] 12/31/2019	[8] 12/31/2020	[9] 12/31/2021	[10] Average
Atmos Energy Corporation	ATO	0.80	0.80	0.80	0.70	0.70	0.60	0.60	0.80	0.80	0.73
New Jersey Resources Corporation	NJR	0.70	0.80	0.80	0.80	0.80	0.70	0.70	0.95	1.00	0.81
NiSource Inc.	NI	0.85	0.85	NMF	NMF	0.60	0.50	0.55	0.85	0.85	0.72
Northwest Natural Gas Company	NWN	0.65	0.70	0.65	0.65	0.70	0.60	0.60	0.80	0.85	0.69
ONE Gas, Inc.	OGS				0.70	0.70	0.65	0.65	0.80	0.80	0.72
Spire, Inc.	SR	0.65	0.70	0.70	0.70	0.70	0.65	0.65	0.85	0.85	0.72
Eversource Energy	ES			0.75	0.70	0.65	0.60	0.55	0.90	0.90	0.72
American States Water Company	AWR	0.65	0.70	0.70	0.75	0.80	0.70	0.65	0.65	0.65	0.69
California Water Service Group	CWT	0.60	0.70	0.75	0.75	0.80	0.70	0.70	0.65	0.70	0.71
Middlesex Water Company	MSEX				0.70	0.70	0.65	0.65	0.80	0.80	0.72
SJW Group	SJW	0.85	0.85	0.75	0.75	0.70	0.60	0.60	0.85	0.80	0.75
Essential Utilities, Inc.	WTRG	0.60	0.70	0.75	0.70	0.75	0.70	0.65	0.95	0.95	0.75
Mean		0.71	0.76	0.74	0.72	0.72	0.64	0.63	0.82	0.83	0.73

Notes:
[1] Value Line, dated December 26, 2013.
[2] Value Line, dated December 31, 2014.
[3] Value Line, dated December 30, 2015.
[4] Value Line, dated December 29, 2016.
[5] Value Line, dated December 28, 2017.
[6] Value Line, dated December 27, 2018.
[7] Value Line, dated December 26, 2019.
[8] Value Line, dated December 30, 2020.
[9] Value Line, dated December 29, 2021.
[10] Average ([1] - [9])

Market Return Derived from Analysts' Long-Term Growth Estimates

[1] Estimated Weighted Average Dividend Yield	1.74%
[2] Estimated Weighted Average Long-Term Growth Rate	10.81%
[3] S&P 500 Estimated Required Market Return	12.64%

STANDARD AND POOR'S 500 INDEX

		[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]
Name	Ticker	Shares Outst'g	Price	Market Capitalization	Weight in Index	Estimated Dividend Yield	Cap-Weighted Dividend Yield	Value Line Long-Term Growth Est.	Cap-Weighted Long-Term Growth Est.
LyondellBasell Industries NV	LYB	325.62	85.01	27,681.30	0.10%	5.60%	0.01%	3.50%	0.00%
Signature Bank/New York NY	SBNY	62.93	139.50	8,778.32	0.03%	1.61%	0.00%	16.50%	0.01%
American Express Co	AXP	747.23	157.59	117,756.45	0.41%	1.32%	0.01%	10.00%	0.04%
Verizon Communications Inc	VZ	4,199.82	38.98	163,708.87	0.57%	6.70%	0.04%	2.50%	0.01%
Broadcom Inc	AVGO	405.01	551.03	223,171.56		2.98%		29.50%	
Boeing Co/The	BA	595.98	178.88	106,609.44					
Caterpillar Inc	CAT	520.41	236.41	123,029.89	0.43%	2.03%	0.01%	11.00%	0.05%
JPMorgan Chase & Co	JPM	2,933.21	138.18	405,310.27	1.41%	2.89%	0.04%	5.00%	0.07%
Chevron Corp	CVX	1,933.64	183.31	354,455.37		3.10%		44.00%	
Coca-Cola Co/The	KO	4,324.51	63.61	275,082.27	0.96%	2.77%	0.03%	7.50%	0.07%
AbbVie Inc	ABBV	1,768.48	161.18	285,043.77	0.99%	3.67%	0.04%	4.50%	0.04%
Walt Disney Co/The	DIS	1,823.59	97.87	178,474.95				30.50%	
FleetCor Technologies Inc	FLT	73.75	196.20	14,470.14	0.05%			10.50%	0.01%
Extra Space Storage Inc	EXR	133.92	160.69	21,519.93	0.07%	3.73%	0.00%	4.00%	0.00%
Exxon Mobil Corp	XOM	4,118.29	111.34	458,530.74		3.27%			
Phillips 66	PSX	472.63	108.44	51,252.21		3.58%		85.00%	
General Electric Co	GE	1,092.67	85.97	93,936.67		0.37%		22.00%	
HP Inc	HPQ	1,005.94	30.04	30,218.41	0.11%	3.50%	0.00%	12.50%	0.01%
Home Depot Inc/The	HD	1,019.19	323.99	330,206.07	1.15%	2.35%	0.03%	9.00%	0.10%
Monolithic Power Systems Inc	MPWR	46.94	381.96	17,929.97		0.79%		23.50%	
International Business Machines Corp	IBM	904.13	148.90	134,624.36	0.47%	4.43%	0.02%	3.00%	0.01%
Johnson & Johnson	JNJ	2,614.48	178.00	465,378.15	1.62%	2.54%	0.04%	8.00%	0.13%
McDonald's Corp	MCD	732.42	272.79	199,797.94	0.69%	2.23%	0.02%	10.50%	0.07%
Merck & Co Inc	MRK	2,535.40	110.12	279,197.81	0.97%	2.65%	0.03%	8.00%	0.08%
3M Co	MMM	552.74	125.97	69,629.04	0.24%	4.73%	0.01%	6.50%	0.02%
American Water Works Co Inc	AWK	181.83	151.76	27,594.22	0.10%	1.73%	0.00%	3.00%	0.00%
Bank of America Corp	BAC	8,022.43	37.63	301,884.12	1.05%	2.34%	0.02%	8.50%	0.09%
Pfizer Inc	PFE	5,613.32	50.13	281,395.48	0.98%	3.19%	0.03%	6.50%	0.06%
Procter & Gamble Co/The	PG	2,369.70	149.16	353,464.00	1.23%	2.45%	0.03%	6.50%	0.08%
AT&T Inc	T	7,127.00	19.28	137,408.56	0.48%	5.76%	0.03%	0.50%	0.00%
Travelers Cos Inc/The	TRV	234.35	189.81	44,481.59	0.15%	1.96%	0.00%	6.50%	0.01%
Raytheon Technologies Corp	RTX	1,470.06	98.72	145,124.42	0.50%	2.23%	0.01%	7.00%	0.04%
Analog Devices Inc	ADI	509.30	171.91	87,553.08	0.30%	1.77%	0.01%	14.00%	0.04%
Walmart Inc	WMT	2,714.24	152.42	413,704.16	1.44%	1.47%	0.02%	7.50%	0.11%
Cisco Systems Inc	CSCO	4,108.10	49.72	204,254.88	0.71%	3.06%	0.02%	8.00%	0.06%
Intel Corp	INTC	4,127.00	30.07	124,098.89	0.43%	4.86%	0.02%	2.50%	0.01%
General Motors Co	GM	1,420.70	40.47	57,495.61	0.20%	0.89%	0.00%	10.00%	0.02%
Microsoft Corp	MSFT	7,454.47	255.14	1,901,934.24	6.61%	1.07%	0.07%	16.50%	1.09%
Dollar General Corp	DG	225.57	255.68	57,674.25	0.20%	0.86%	0.00%	10.00%	0.02%
Cigna Corp	CI	305.74	328.89	100,554.50	0.35%	1.36%	0.00%	10.00%	0.03%
Kinder Morgan Inc	KMI	2,247.74	19.12	42,976.83	0.15%	5.81%	0.01%	19.00%	0.03%
Citigroup Inc	C	1,936.85	48.41	93,763.05	0.33%	4.21%	0.01%	3.50%	0.01%
American International Group Inc	AIG	742.98	63.11	46,889.47	0.16%	2.03%	0.00%	6.50%	0.01%
Altria Group Inc	MO	1,792.17	46.58	83,479.42	0.29%	8.07%	0.02%	5.50%	0.02%
HCA Healthcare Inc	HCA	282.72	240.22	67,914.28	0.24%	0.93%	0.00%	12.50%	0.03%
International Paper Co	IP	355.67	37.12	13,202.47	0.05%	4.98%	0.00%	12.50%	0.01%
Hewlett Packard Enterprise Co	HPE	1,281.00	16.78	21,495.18	0.07%	2.86%	0.00%	7.50%	0.01%
Abbott Laboratories	ABT	1,743.57	107.58	187,573.69	0.65%	1.75%	0.01%	7.00%	0.05%
Aflac Inc	AFL	621.79	71.93	44,725.28	0.16%	2.34%	0.00%	9.00%	0.01%
Air Products and Chemicals Inc	APD	221.87	310.16	68,813.96	0.24%	2.09%	0.00%	11.00%	0.03%
Royal Caribbean Cruises Ltd	RCL	255.18	59.93	15,293.06					
Hess Corp	HES	308.31	143.91	44,368.60		1.04%			
Archer-Daniels-Midland Co	ADM	549.33	97.50	53,560.07	0.19%	1.64%	0.00%	13.00%	0.02%
Automatic Data Processing Inc	ADP	414.83	264.14	109,572.67	0.38%	1.89%	0.01%	10.00%	0.04%
Verisk Analytics Inc	VRSK	156.39	183.71	28,730.04	0.10%	0.67%	0.00%	13.00%	0.01%
AutoZone Inc	AZO	18.98	2,579.00	48,952.00	0.17%			14.50%	0.02%
Avery Dennison Corp	AVY	80.97	193.33	15,653.74	0.05%	1.55%	0.00%	12.00%	0.01%
Enphase Energy Inc	ENPH	135.92	320.59	43,575.88				26.50%	
MSCI Inc	MSCI	79.96	507.83	40,605.07	0.14%	0.98%	0.00%	14.50%	0.02%
Ball Corp	BALL	313.92	56.08	17,604.63		1.43%		21.50%	
Ceridian HCM Holding Inc	CDAY	153.60	68.44	10,512.04					
Carrier Global Corp	CARR	836.26	44.32	37,063.13		1.35%			
Bank of New York Mellon Corp/The	BK	808.28	45.90	37,100.05	0.13%	3.22%	0.00%	6.00%	0.01%
Otis Worldwide Corp	OTIS	416.59	78.09	32,531.20		1.49%			
Baxter International Inc	BAX	504.12	56.24	28,351.77	0.10%	2.06%	0.00%	8.00%	0.01%
Becton Dickinson and Co	BDX	283.38	249.34	70,656.97	0.25%	1.46%	0.00%	4.50%	0.01%
Berkshire Hathaway Inc	BRK/B	1,301.98	318.60	414,811.15	1.44%			6.00%	0.09%
Best Buy Co Inc	BBY	225.13	85.30	19,203.67	0.07%	4.13%	0.00%	4.00%	0.00%
Boston Scientific Corp	BSX	1,432.31	45.27	64,840.72	0.23%			17.00%	0.04%
Bristol-Myers Squibb Co	BMY	2,126.16	80.28	170,688.12		2.69%			
Fortune Brands Home & Security Inc	FBHS	128.24	65.34	8,379.40	0.03%	1.71%	0.00%	10.00%	0.00%
Brown-Forman Corp	BF/B	309.92	72.81	22,566.96	0.08%	1.13%	0.00%	14.00%	0.01%
Coterra Energy Inc	CTRA	788.47	27.91	22,006.11		9.75%			
Campbell Soup Co	CPB	299.76	53.67	16,088.01	0.06%	2.76%	0.00%	5.00%	0.00%
Hilton Worldwide Holdings Inc	HLT	270.46	142.62	38,572.43		0.42%			
Carnival Corp	CCL	1,112.71	9.93	11,049.18					
Qorvo Inc	QRVO	101.39	99.25	10,062.86	0.03%			14.50%	0.01%
Lumen Technologies Inc	LUMN	1,034.58	5.47	5,659.17	0.02%			3.50%	0.00%
UDR Inc	UDR	325.54	41.47	13,500.23	0.05%	3.67%	0.00%	10.50%	0.00%
Clorox Co/The	CLX	123.39	148.65	18,341.18	0.06%	3.18%	0.00%	7.50%	0.00%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Paycom Software Inc	PAYC	60.02	339.10	20,352.78				21.00%	
CMS Energy Corp	CMS	290.25	61.07	17,725.69	0.06%	3.01%	0.00%	6.50%	0.00%
Newell Brands Inc	NWL	413.60	12.97	5,364.39		7.09%			
Colgate-Palmolive Co	CL	835.21	77.48	64,712.38	0.22%	2.43%	0.01%	6.50%	0.01%
EPAM Systems Inc	EPAM	57.51	368.58	21,198.14				20.50%	
Comerica Inc	CMA	130.95	71.74	9,394.50	0.03%	3.79%	0.00%	9.00%	0.00%
Conagra Brands Inc	CAG	479.26	37.98	18,202.10	0.06%	3.48%	0.00%	4.00%	0.00%
Consolidated Edison Inc	ED	354.86	98.04	34,790.77	0.12%	3.22%	0.00%	4.00%	0.00%
Corning Inc	GLW	845.81	34.13	28,867.53	0.10%	3.16%	0.00%	17.50%	0.02%
Cummins Inc	CMI	141.02	251.16	35,419.09	0.12%	2.50%	0.00%	8.50%	0.01%
Caesars Entertainment Inc	CZR	214.57	50.81	10,902.10					
Danaher Corp	DHR	727.96	273.41	199,032.36	0.69%	0.37%	0.00%	17.00%	0.12%
Target Corp	TGT	460.31	167.07	76,903.99	0.27%	2.59%	0.01%	12.00%	0.03%
Deere & Co	DE	301.82	441.00	133,102.62	0.46%	1.02%	0.00%	16.50%	0.08%
Dominion Energy Inc	D	833.28	60.44	50,365.22	0.18%	4.42%	0.01%	5.50%	0.01%
Dover Corp	DOV	140.35	141.95	19,923.25	0.07%	1.42%	0.00%	9.00%	0.01%
Alliant Energy Corp	LNT	251.02	56.30	14,132.54	0.05%	3.04%	0.00%	6.00%	0.00%
Duke Energy Corp	DUK	770.00	99.93	76,946.10	0.27%	4.02%	0.01%	5.00%	0.01%
Regency Centers Corp	REG	171.12	66.43	11,367.70	0.04%	3.91%	0.00%	12.50%	0.00%
Eaton Corp PLC	ETN	397.70	163.45	65,004.07	0.23%	1.98%	0.00%	12.00%	0.03%
Ecolab Inc	ECL	284.83	149.83	42,675.78	0.15%	1.36%	0.00%	10.50%	0.02%
PerkinElmer Inc	PKI	126.32	139.73	17,650.13	0.06%	0.20%	0.00%	4.00%	0.00%
Emerson Electric Co	EMR	591.40	95.77	56,638.38	0.20%	2.17%	0.00%	10.50%	0.02%
EOG Resources Inc	EOG	587.39	141.93	83,368.12		2.33%		26.00%	
Aon PLC	AON	206.85	308.28	63,768.64	0.22%	0.73%	0.00%	7.50%	0.02%
Entergy Corp	ETR	203.48	116.27	23,659.08	0.08%	3.68%	0.00%	4.00%	0.00%
Equifax Inc	EFX	122.44	197.37	24,166.57	0.08%	0.79%	0.00%	7.00%	0.01%
EQT Corp	EQT	367.05	42.41	15,566.42		1.41%			
IQVIA Holdings Inc	IQV	185.74	218.02	40,495.03	0.14%			14.50%	0.02%
Gartner Inc	IT	79.02	350.37	27,687.64	0.10%			18.00%	0.02%
FedEx Corp	FDX	260.22	182.22	47,417.29	0.16%	2.52%	0.00%	13.00%	0.02%
FMC Corp	FMC	125.97	130.64	16,456.20	0.06%	1.62%	0.00%	11.00%	0.01%
Brown & Brown Inc	BRO	283.22	59.59	16,877.20	0.06%	0.77%	0.00%	8.00%	0.00%
Ford Motor Co	F	3,949.64	13.90	54,900.02		4.32%		33.50%	
NextEra Energy Inc	NEE	1,987.16	84.70	168,312.79	0.59%	2.01%	0.01%	10.50%	0.06%
Franklin Resources Inc	BEN	499.56	26.81	13,393.18	0.05%	4.33%	0.00%	4.00%	0.00%
Garmin Ltd	GRMN	191.66	92.99	17,822.84	0.06%	3.14%	0.00%	6.00%	0.00%
Freeport-McMoRan Inc	FCX	1,429.33	39.80	56,887.21		1.51%		27.00%	
Dexcom Inc	DXCM	386.26	116.28	44,914.08					
General Dynamics Corp	GD	274.55	252.39	69,293.42	0.24%	2.00%	0.00%	9.00%	0.02%
General Mills Inc	GIS	593.54	85.30	50,628.62	0.18%	2.53%	0.00%	3.50%	0.01%
Genuine Parts Co	GPC	141.16	182.44	25,752.71	0.09%	1.96%	0.00%	9.00%	0.01%
Atmos Energy Corp	ATO	140.90	120.20	16,936.30	0.06%	2.46%	0.00%	7.50%	0.00%
WW Grainger Inc	GWW	50.53	603.06	30,472.02	0.11%	1.14%	0.00%	9.50%	0.01%
Halliburton Co	HAL	908.05	37.89	34,405.90		1.27%		31.00%	
L3Harris Technologies Inc	LHX	190.40	227.08	43,236.71	0.15%	1.97%	0.00%	18.00%	0.03%
Healthpeak Properties Inc	PEAK	537.54	26.26	14,115.80	0.05%	4.57%	0.00%	17.00%	0.01%
Catalent Inc	CTLT	179.96	50.13	9,021.60				21.00%	
Fortive Corp	FTV	353.81	67.55	23,899.73	0.08%	0.41%	0.00%	12.00%	0.01%
Hershey Co/The	HSY	146.97	235.17	34,562.70	0.12%	1.76%	0.00%	9.00%	0.01%
Synchrony Financial	SYF	450.54	37.58	16,931.33	0.06%	2.45%	0.00%	9.50%	0.01%
Hormel Foods Corp	HRL	546.20	47.00	25,671.31	0.09%	2.34%	0.00%	6.50%	0.01%
Arthur J Gallagher & Co	AJG	210.84	198.60	41,872.85	0.15%	1.03%	0.00%	18.50%	0.03%
Mondelez International Inc	MDLZ	1,365.62	67.61	92,329.50	0.32%	2.28%	0.01%	9.50%	0.03%
CenterPoint Energy Inc	CNP	629.43	31.11	19,581.63	0.07%	2.31%	0.00%	6.50%	0.00%
Humana Inc	HUM	126.60	549.90	69,617.34	0.24%	0.57%	0.00%	11.00%	0.03%
Willis Towers Watson PLC	WTW	108.24	246.16	26,643.87	0.09%	1.33%	0.00%	8.50%	0.01%
Illinois Tool Works Inc	ITW	307.19	227.47	69,875.60	0.24%	2.30%	0.01%	11.00%	0.03%
CDW Corp/DE	CDW	135.39	188.64	25,540.16	0.09%	1.25%	0.00%	8.50%	0.01%
Trane Technologies PLC	TT	230.31	177.75	40,937.07		1.51%			
Interpublic Group of Cos Inc/The	IPG	388.53	34.36	13,349.72	0.05%	3.38%	0.00%	10.00%	0.00%
International Flavors & Fragrances Inc	IFF	254.96	105.82	26,980.08	0.09%	3.06%	0.00%	7.50%	0.01%
Generac Holdings Inc	GNRC	63.36	105.52	6,685.33				23.50%	
NXP Semiconductors NV	NXPI	259.14	175.84	45,566.30	0.16%	1.92%	0.00%	12.00%	0.02%
Kellogg Co	K	341.28	72.95	24,896.45	0.09%	3.24%	0.00%	3.50%	0.00%
Broadridge Financial Solutions Inc	BR	117.66	149.11	17,543.54	0.06%	1.94%	0.00%	9.50%	0.01%
Kimberly-Clark Corp	KMB	337.49	135.63	45,774.04	0.16%	3.42%	0.01%	5.50%	0.01%
Kimco Realty Corp	KIM	618.46	22.92	14,175.13	0.05%	4.01%	0.00%	8.50%	0.00%
Oracle Corp	ORCL	2,696.17	83.03	223,862.66	0.78%	1.54%	0.01%	10.00%	0.08%
Kroger Co/The	KR	715.81	49.19	35,210.50	0.12%	2.11%	0.00%	6.50%	0.01%
Lennar Corp	LEN	254.77	87.83	22,376.19	0.08%	1.71%	0.00%	9.00%	0.01%
Eli Lilly & Co	LLY	950.18	371.08	352,592.05	1.23%	1.06%	0.01%	11.50%	0.14%
Bath & Body Works Inc	BBWI	228.42	42.50	9,707.64		1.88%		26.50%	
Charter Communications Inc	CHTR	155.67	391.29	60,912.90				22.50%	
Lincoln National Corp	LNC	169.22	38.94	6,589.23	0.02%	4.62%	0.00%	11.50%	0.00%
Loews Corp	L	237.43	58.15	13,806.38	0.05%	0.43%	0.00%	18.50%	0.01%
Lowe's Cos Inc	LOW	604.70	212.55	128,529.62	0.45%	1.98%	0.01%	12.50%	0.06%
IDEX Corp	IEX	75.42	237.49	17,911.73	0.06%	1.01%	0.00%	11.00%	0.01%
Marsh & McLennan Cos Inc	MMC	496.01	173.18	85,899.01	0.30%	1.36%	0.00%	11.00%	0.03%
Masco Corp	MAS	225.53	50.78	11,452.36	0.04%	2.21%	0.00%	8.50%	0.00%
S&P Global Inc	SPGI	325.80	352.80	114,942.24	0.40%	0.96%	0.00%	9.50%	0.04%
Medtronic PLC	MDT	1,330.15	79.04	105,134.98	0.37%	3.44%	0.01%	7.50%	0.03%
Viatris Inc	VTRS	1,212.69	11.03	13,375.92		4.35%			
CVS Health Corp	CVS	1,313.97	101.88	133,866.96	0.47%	2.16%	0.01%	6.00%	0.03%
DuPont de Nemours Inc	DD	496.79	70.51	35,028.59	0.12%	1.87%	0.00%	10.00%	0.01%
Micron Technology Inc	MU	1,087.17	57.65	62,675.29	0.22%	0.80%	0.00%	16.00%	0.03%
Motorola Solutions Inc	MSI	167.20	272.20	45,512.66	0.16%	1.29%	0.00%	8.00%	0.01%
Cboe Global Markets Inc	CBOE	106.08	126.84	13,455.44	0.05%	1.58%	0.00%	10.00%	0.00%
Laboratory Corp of America Holdings	LH	88.60	240.70	21,326.02	0.07%	1.20%	0.00%	1.50%	0.00%
Newmont Corp	NEM	793.74	47.47	37,678.79	0.13%	4.63%	0.01%	9.50%	0.01%
NIKE Inc	NKE	1,259.69	109.69	138,175.18		1.24%		24.00%	

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
NiSource Inc	NI	406.13	27.94	11,347.38	0.04%	3.36%	0.00%	9.50%	0.00%
Norfolk Southern Corp	NSC	231.51	256.50	59,383.34	0.21%	1.93%	0.00%	10.00%	0.02%
Principal Financial Group Inc	PFG	244.68	89.68	21,943.17	0.08%	2.85%	0.00%	6.00%	0.00%
Eversource Energy	ES	348.31	82.86	28,860.72	0.10%	3.08%	0.00%	6.50%	0.01%
Northrop Grumman Corp	NOC	153.91	533.29	82,079.73	0.29%	1.30%	0.00%	6.50%	0.02%
Wells Fargo & Co	WFC	3,810.49	47.95	182,713.04	0.64%	2.50%	0.02%	12.00%	0.08%
Nucor Corp	NUE	256.54	149.95	38,468.77	0.13%	1.33%	0.00%	2.50%	0.00%
Occidental Petroleum Corp	OXY	908.91	69.49	63,160.43		0.75%			
Omnicom Group Inc	OMC	203.92	79.76	16,264.34	0.06%	3.51%	0.00%	6.50%	0.00%
ONEOK Inc	OKE	446.95	66.92	29,910.16	0.10%	5.59%	0.01%	11.50%	0.01%
Raymond James Financial Inc	RJF	215.06	116.90	25,140.98	0.09%	1.16%	0.00%	10.50%	0.01%
PG&E Corp	PCG	1,987.70	15.70	31,206.89	0.11%			7.50%	0.01%
Parker-Hannifin Corp	PH	128.41	298.94	38,385.69	0.13%	1.78%	0.00%	14.00%	0.02%
Rollins Inc	ROL	492.47	40.44	19,915.57	0.07%	1.29%	0.00%	10.50%	0.01%
PPL Corp	PPL	736.32	29.52	21,736.11	0.08%	3.05%	0.00%	3.00%	0.00%
ConocoPhillips	COP	1,246.07	123.51	153,902.23	0.54%	1.65%	0.01%	20.00%	0.11%
PulteGroup Inc	PHM	227.82	44.78	10,201.78	0.04%	1.34%	0.00%	11.00%	0.00%
Pinnacle West Capital Corp	PNW	113.14	78.32	8,861.12	0.03%	4.42%	0.00%	0.50%	0.00%
PNC Financial Services Group Inc/The	PNC	403.32	168.26	67,862.45	0.24%	3.57%	0.01%	12.00%	0.03%
PPG Industries Inc	PPG	235.03	135.22	31,780.35	0.11%	1.83%	0.00%	4.00%	0.00%
Progressive Corp/The	PGR	585.00	132.15	77,307.75	0.27%	0.30%	0.00%	6.50%	0.02%
Public Service Enterprise Group Inc	PEG	498.95	60.55	30,211.42	0.11%	3.57%	0.00%	4.50%	0.00%
Robert Half International Inc	RHI	108.50	78.78	8,547.55	0.03%	2.18%	0.00%	7.50%	0.00%
Edison International	EIX	381.88	66.66	25,455.79	0.09%	4.20%	0.00%	16.00%	0.01%
Schlumberger Ltd	SLB	1,417.99	51.55	73,097.59		1.36%		23.50%	
Charles Schwab Corp/The	SCHW	1,815.85	82.54	149,879.93	0.52%	1.07%	0.01%	9.00%	0.05%
Sherwin-Williams Co/The	SHW	259.14	249.18	64,573.25	0.22%	0.96%	0.00%	11.50%	0.03%
West Pharmaceutical Services Inc	WST	74.03	234.66	17,372.58	0.06%	0.32%	0.00%	17.00%	0.01%
J M Smucker Co/The	SJM	106.64	154.01	16,423.47	0.06%	2.65%	0.00%	4.00%	0.00%
Snap-on Inc	SNA	53.16	240.60	12,789.09	0.04%	2.69%	0.00%	4.50%	0.00%
AMETEK Inc	AME	229.65	142.42	32,707.32	0.11%	0.62%	0.00%	10.00%	0.01%
Southern Co/The	SO	1,088.67	67.64	73,637.84	0.26%	4.02%	0.01%	6.50%	0.02%
Truist Financial Corp	TFC	1,326.77	46.81	62,105.92	0.22%	4.44%	0.01%	5.50%	0.01%
Southwest Airlines Co	LUV	593.75	39.91	23,696.64					
W R Berkley Corp	WRB	265.48	76.28	20,250.51	0.07%	0.52%	0.00%	15.50%	0.01%
Stanley Black & Decker Inc	SWK	147.94	81.72	12,089.82	0.04%	3.92%	0.00%	6.00%	0.00%
Public Storage	PSA	175.64	297.96	52,333.10	0.18%	2.68%	0.00%	8.00%	0.01%
Arista Networks Inc	ANET	305.57	139.30	42,566.32	0.15%			10.00%	0.01%
Sysco Corp	SYY	506.77	86.51	43,840.50	0.15%	2.27%	0.00%	16.50%	0.03%
Corteva Inc	CTVA	718.60	67.16	48,261.18	0.17%	0.89%	0.00%	16.50%	0.03%
Texas Instruments Inc	TXN	907.57	180.46	163,780.44	0.57%	2.75%	0.02%	9.00%	0.05%
Textron Inc	TXT	208.77	71.38	14,902.07	0.05%	0.11%	0.00%	10.50%	0.01%
Thermo Fisher Scientific Inc	TMO	392.20	560.22	219,716.04	0.76%	0.21%	0.00%	11.00%	0.08%
TJX Cos Inc/The	TJX	1,155.50	80.05	92,498.10	0.32%	1.47%	0.00%	17.00%	0.05%
Globe Life Inc	GL	97.27	119.96	11,668.51	0.04%	0.69%	0.00%	8.00%	0.00%
Johnson Controls International plc	JCI	686.70	66.44	45,624.61	0.16%	2.11%	0.00%	13.00%	0.02%
Ulta Beauty Inc	ULTA	51.22	464.84	23,809.57	0.08%			15.50%	0.01%
Union Pacific Corp	UNP	614.80	217.43	133,676.18	0.46%	2.39%	0.01%	9.50%	0.04%
Keysight Technologies Inc	KEYS	178.50	180.89	32,288.87	0.11%			13.00%	0.01%
UnitedHealth Group Inc	UNH	934.35	547.76	511,799.01	1.78%	1.20%	0.02%	12.00%	0.21%
Marathon Oil Corp	MRO	635.07	30.63	19,452.13		1.18%			
Bio-Rad Laboratories Inc	BIO	24.75	414.71	10,263.66	0.04%			11.50%	0.00%
Ventas Inc	VTR	399.72	46.53	18,598.88	0.06%	3.87%	0.00%	10.50%	0.01%
VF Corp	VFC	388.57	32.82	12,752.74	0.04%	6.22%	0.00%	9.00%	0.00%
Vornado Realty Trust	VNO	191.82	25.29	4,851.05		8.38%		-20.50%	
Vulcan Materials Co	VMC	132.91	183.33	24,365.84	0.08%	0.87%	0.00%	8.50%	0.01%
Weyerhaeuser Co	WY	735.92	32.53	23,939.38	0.08%	2.21%	0.00%	7.00%	0.01%
Whirlpool Corp	WHR	54.48	146.53	7,982.66	0.03%	4.78%	0.00%	6.00%	0.00%
Williams Cos Inc/The	WMB	1,218.34	34.70	42,276.40	0.15%	4.90%	0.01%	12.00%	0.02%
Constellation Energy Corp	CEG	326.66	96.12	31,398.94		0.59%			
WEC Energy Group Inc	WEC	315.44	99.14	31,272.23	0.11%	2.94%	0.00%	6.00%	0.01%
Adobe Inc	ADBE	464.90	344.93	160,357.96	0.56%			14.50%	0.08%
AES Corp/The	AES	667.95	28.92	19,317.11	0.07%	2.19%	0.00%	14.00%	0.01%
Amgen Inc	AMGN	533.58	286.40	152,817.03	0.53%	2.71%	0.01%	5.50%	0.03%
Apple Inc	AAPL	15,908.12	148.03	2,354,878.71	8.19%	0.62%	0.05%	14.00%	1.15%
Autodesk Inc	ADSK	215.86	201.95	43,592.73	0.15%			14.00%	0.02%
Cintas Corp	CTAS	101.55	461.78	46,891.45	0.16%	1.00%	0.00%	14.00%	0.02%
Comcast Corp	CMCSA	4,313.96	36.64	158,063.64	0.55%	2.95%	0.02%	9.50%	0.05%
Molson Coors Beverage Co	TAP	200.15	54.73	10,953.94		2.78%		49.50%	
KLA Corp	KLAC	141.72	393.15	55,716.43	0.19%	1.32%	0.00%	20.00%	0.04%
Marriott International Inc/MD	MAR	316.54	165.35	52,339.89	0.18%	0.97%	0.00%	17.50%	0.03%
McCormick & Co Inc/MD	MKC	250.60	85.18	21,346.19	0.07%	1.83%	0.00%	5.00%	0.00%
PACCAR Inc	PCAR	347.77	105.91	36,832.11	0.13%	1.40%	0.00%	5.00%	0.01%
Costco Wholesale Corp	COST	442.60	539.25	238,674.21	0.83%	0.67%	0.01%	10.50%	0.09%
First Republic Bank/CA	FRC	182.93	127.61	23,343.06	0.08%	0.85%	0.00%	11.50%	0.01%
Stryker Corp	SYK	378.43	233.89	88,510.99	0.31%	1.19%	0.00%	8.50%	0.03%
Tyson Foods Inc	TSN	289.58	66.28	19,193.30	0.07%	2.90%	0.00%	6.00%	0.00%
Lamb Weston Holdings Inc	LW	143.83	86.90	12,498.91	0.04%	1.13%	0.00%	11.50%	0.00%
Applied Materials Inc	AMAT	860.31	109.60	94,289.87	0.33%	0.95%	0.00%	17.00%	0.06%
American Airlines Group Inc	AAL	649.90	14.43	9,378.07					
Cardinal Health Inc	CAH	262.13	80.17	21,015.28	0.07%	2.47%	0.00%	5.00%	0.00%
Cincinnati Financial Corp	CINF	157.18	110.96	17,441.14	0.06%	2.49%	0.00%	9.00%	0.01%
Paramount Global	PARA	608.47	20.08	12,218.08	0.04%	4.78%	0.00%	4.50%	0.00%
DR Horton Inc	DHI	344.34	85.75	29,527.24	0.10%	1.17%	0.00%	13.00%	0.01%
Electronic Arts Inc	EA	276.08	130.78	36,105.74	0.13%	0.58%	0.00%	11.50%	0.01%
Expeditors International of Washington Inc	EXPD	159.14	116.06	18,469.32	0.06%	1.15%	0.00%	10.00%	0.01%
Fastenal Co	FAST	572.76	51.51	29,502.87	0.10%	2.41%	0.00%	8.50%	0.01%
M&T Bank Corp	MTB	172.61	170.02	29,347.66	0.10%	2.82%	0.00%	9.00%	0.01%
Xcel Energy Inc	XEL	547.25	70.22	38,427.75	0.13%	2.78%	0.00%	6.00%	0.01%
Fiserv Inc	FISV	635.03	104.36	66,271.52	0.23%			11.00%	0.03%
Fifth Third Bancorp	FITB	686.40	36.36	24,957.36	0.09%	3.63%	0.00%	9.50%	0.01%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Gilead Sciences Inc	GILD	1,254.24	87.83	110,160.25	0.38%	3.32%	0.01%	12.00%	0.05%
Hasbro Inc	HAS	138.11	62.82	8,676.32	0.03%	4.46%	0.00%	9.00%	0.00%
Huntington Bancshares Inc/OH	HBAN	1,442.73	15.48	22,333.52	0.08%	4.01%	0.00%	12.50%	0.01%
Welltower Inc	WELL	472.52	71.03	33,563.17	0.12%	3.44%	0.00%	3.50%	0.00%
Biogen Inc	BIIB	144.00	305.17	43,944.79				-10.50%	
Northern Trust Corp	NTRS	208.42	93.11	19,405.61	0.07%	3.22%	0.00%	8.00%	0.01%
Packaging Corp of America	PKG	92.53	135.89	12,574.45	0.04%	3.68%	0.00%	11.00%	0.00%
Paychex Inc	PAYX	360.40	124.03	44,700.54	0.16%	2.55%	0.00%	10.00%	0.02%
QUALCOMM Inc	QCOM	1,121.00	126.49	141,795.29	0.49%	2.37%	0.01%	19.00%	0.09%
Roper Technologies Inc	ROP	106.05	438.89	46,545.16	0.16%	0.62%	0.00%	3.50%	0.01%
Ross Stores Inc	ROST	347.06	117.67	40,838.90	0.14%	1.05%	0.00%	14.00%	0.02%
IDEXX Laboratories Inc	IDXX	82.82	425.87	35,269.28	0.12%			12.00%	0.01%
Starbucks Corp	SBUX	1,147.80	102.20	117,305.16	0.41%	2.07%	0.01%	16.00%	0.07%
KeyCorp	KEY	932.97	18.81	17,549.17	0.06%	4.36%	0.00%	7.50%	0.00%
Fox Corp	FOXA	302.48	32.45	9,815.31	0.03%	1.54%	0.00%	11.00%	0.00%
Fox Corp	FOX	240.22	30.52	7,331.48		1.64%			
State Street Corp	STT	366.94	79.67	29,234.11	0.10%	3.16%	0.00%	8.50%	0.01%
Norwegian Cruise Line Holdings Ltd	NCLH	421.40	16.44	6,927.75					
US Bancorp	USB	1,485.82	45.39	67,441.51	0.23%	4.23%	0.01%	6.00%	0.01%
A O Smith Corp	AOS	126.87	60.74	7,706.08	0.03%	1.98%	0.00%	11.50%	0.00%
Gen Digital Inc	GEN	651.36	22.96	14,955.23	0.05%	2.18%	0.00%	11.50%	0.01%
T Rowe Price Group Inc	TROW	223.47	124.91	27,913.01	0.10%	3.84%	0.00%	8.00%	0.01%
Waste Management Inc	WM	410.48	167.07	68,578.43	0.24%	1.56%	0.00%	6.50%	0.02%
Constellation Brands Inc	STZ	184.47	257.35	47,472.33	0.17%	1.24%	0.00%	5.00%	0.01%
DENTSPLY SIRONA Inc	XRAY	214.91	30.26	6,503.24	0.02%	1.65%	0.00%	12.00%	0.00%
Zions Bancorp NA	ZION	149.62	51.82	7,753.20	0.03%	3.16%	0.00%	6.50%	0.00%
Alaska Air Group Inc	ALK	126.84	47.44	6,017.19					
Invesco Ltd	IVZ	454.79	19.11	8,690.94	0.03%	3.92%	0.00%	10.00%	0.00%
Linde PLC	LIN	493.91	335.31	165,612.68	0.58%	1.40%	0.01%	12.00%	0.07%
Intuit Inc	INTU	280.93	407.59	114,502.22	0.40%	0.77%	0.00%	17.50%	0.07%
Morgan Stanley	MS	1,690.11	93.07	157,298.44	0.55%	3.33%	0.02%	10.50%	0.06%
Microchip Technology Inc	MCHP	550.01	79.19	43,555.21	0.15%	1.66%	0.00%	10.00%	0.02%
Chubb Ltd	CB	415.05	219.59	91,140.83	0.32%	1.51%	0.00%	14.50%	0.05%
Hologic Inc	HOLX	245.83	76.16	18,722.72				25.00%	
Citizens Financial Group Inc	CFG	492.49	42.38	20,871.77	0.07%	3.96%	0.00%	8.00%	0.01%
O'Reilly Automotive Inc	ORLY	62.58	864.54	54,099.46	0.19%			13.00%	0.02%
Allstate Corp/The	ALL	265.21	133.90	35,511.62	0.12%	2.54%	0.00%	2.50%	0.00%
Equity Residential	EQR	377.92	64.86	24,511.83		3.85%		-6.00%	
BorgWarner Inc	BWA	234.15	42.51	9,953.89	0.03%	1.60%	0.00%	9.50%	0.00%
Keurig Dr Pepper Inc	KDP	1,416.25	38.67	54,766.43	0.19%	2.07%	0.00%	11.50%	0.02%
Organon & Co	OGN	254.36	26.02	6,618.55		4.30%			
Host Hotels & Resorts Inc	HST	715.03	18.94	13,542.63		2.53%		59.50%	
Incyte Corp	INCY	222.48	79.67	17,724.58				25.50%	
Simon Property Group Inc	SPG	326.95	119.44	39,050.43	0.14%	6.03%	0.01%	3.00%	0.00%
Eastman Chemical Co	EMN	119.99	86.62	10,393.53	0.04%	3.51%	0.00%	9.50%	0.00%
AvalonBay Communities Inc	AVB	139.90	174.90	24,467.99	0.09%	3.64%	0.00%	8.00%	0.01%
Prudential Financial Inc	PRU	368.00	108.03	39,755.04	0.14%	4.44%	0.01%	5.50%	0.01%
United Parcel Service Inc	UPS	729.82	189.73	138,468.94	0.48%	3.20%	0.02%	11.50%	0.06%
Walgreens Boots Alliance Inc	WBA	864.81	41.50	35,889.74	0.12%	4.63%	0.01%	5.00%	0.01%
STERIS PLC	STE	99.82	185.74	18,541.12	0.06%	1.01%	0.00%	10.00%	0.01%
McKesson Corp	MCK	141.79	381.68	54,119.55	0.19%	0.57%	0.00%	10.00%	0.02%
Lockheed Martin Corp	LMT	262.07	485.19	127,155.68	0.44%	2.47%	0.01%	8.00%	0.04%
AmerisourceBergen Corp	ABC	205.68	170.69	35,106.84	0.12%	1.14%	0.00%	8.50%	0.01%
Capital One Financial Corp	COF	381.70	103.24	39,406.60		2.32%			
Waters Corp	WAT	59.41	346.60	20,590.81	0.07%			6.00%	0.00%
Nordson Corp	NDSN	57.21	236.49	13,529.83	0.05%	1.10%	0.00%	12.00%	0.01%
Dollar Tree Inc	DLTR	221.18	150.29	33,241.74	0.12%			12.00%	0.01%
Darden Restaurants Inc	DRI	122.39	146.99	17,989.67		3.29%		21.50%	
Match Group Inc	MTCH	279.31	50.56	14,121.71				21.00%	
Domino's Pizza Inc	DPZ	35.40	388.73	13,760.65	0.05%	1.13%	0.00%	14.00%	0.01%
NVR Inc	NVR	3.20	4,639.01	14,826.28	0.05%			5.50%	0.00%
NetApp Inc	NTAP	217.37	67.61	14,696.12	0.05%	2.96%	0.00%	8.00%	0.00%
DXC Technology Co	DXC	230.07	29.67	6,826.03	0.02%			12.00%	0.00%
Old Dominion Freight Line Inc	ODFL	110.48	302.61	33,432.96	0.12%	0.40%	0.00%	11.50%	0.01%
DaVita Inc	DVA	90.10	73.73	6,643.07	0.02%			8.50%	0.00%
Hartford Financial Services Group Inc/The	HIG	318.10	76.37	24,293.22	0.08%	2.23%	0.00%	6.50%	0.01%
Iron Mountain Inc	IRM	290.71	54.33	15,794.49	0.05%	4.55%	0.00%	11.00%	0.01%
Estee Lauder Cos Inc/The	EL	231.27	235.79	54,531.15	0.19%	1.12%	0.00%	14.00%	0.03%
Cadence Design Systems Inc	CDNS	274.32	172.04	47,193.32	0.16%			12.00%	0.02%
Tyler Technologies Inc	TYL	41.64	342.74	14,271.69	0.05%			12.00%	0.01%
Universal Health Services Inc	UHS	64.16	130.85	8,394.94	0.03%	0.61%	0.00%	7.00%	0.00%
Skyworks Solutions Inc	SWKS	160.16	95.62	15,314.59	0.05%	2.59%	0.00%	13.00%	0.01%
Quest Diagnostics Inc	DGX	113.89	151.83	17,291.46	0.06%	1.74%	0.00%	3.50%	0.00%
Activision Blizzard Inc	ATVI	782.63	73.95	57,875.12	0.20%	0.64%	0.00%	12.50%	0.03%
Rockwell Automation Inc	ROK	114.84	264.22	30,344.08	0.11%	1.79%	0.00%	9.50%	0.01%
Kraft Heinz Co/The	KHC	1,224.93	39.35	48,201.00	0.17%	4.07%	0.01%	6.50%	0.01%
American Tower Corp	AMT	465.61	221.25	103,015.33	0.36%	2.66%	0.01%	9.00%	0.03%
Regeneron Pharmaceuticals Inc	REGN	107.08	751.70	80,495.04	0.28%			3.00%	0.01%
Amazon.com Inc	AMZN	10,201.65	96.54	984,867.68				26.50%	
Jack Henry & Associates Inc	JKHY	72.95	189.35	13,812.89	0.05%	1.04%	0.00%	9.00%	0.00%
Ralph Lauren Corp	RL	41.09	113.12	4,648.21	0.02%	2.65%	0.00%	12.00%	0.00%
Boston Properties Inc	BXP	156.76	72.08	11,298.90		5.44%		-1.00%	
Amphenol Corp	APH	595.10	80.43	47,863.49	0.17%	1.04%	0.00%	13.00%	0.02%
Howmet Aerospace Inc	HWM	413.71	37.67	15,584.53	0.05%	0.42%	0.00%	12.00%	0.01%
Pioneer Natural Resources Co	PXD	237.60	235.99	56,070.99		9.68%		21.00%	
Valero Energy Corp	VLO	385.52	133.62	51,513.58	0.18%	2.93%	0.01%	11.00%	0.02%
Synopsys Inc	SNPS	152.91	339.54	51,919.40	0.18%			12.50%	0.02%
Etsy Inc	ETSY	125.69	132.09	16,602.13				24.50%	
CH Robinson Worldwide Inc	CHRW	117.71	99.61	11,724.99	0.04%	2.45%	0.00%	8.50%	0.00%
Accenture PLC	ACN	630.08	300.93	189,609.97	0.66%	1.49%	0.01%	12.50%	0.08%
TransDigm Group Inc	TDG	54.38	628.50	34,174.69	0.12%			19.50%	0.02%

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Yum! Brands Inc	YUM	281.69	128.66	36,241.98	0.13%	1.77%	0.00%	10.50%	0.01%
Prologis Inc	PLD	923.08	117.79	108,729.48	0.38%	2.68%	0.01%	6.00%	0.02%
FirstEnergy Corp	FE	571.75	41.24	23,579.09	0.08%	3.78%	0.00%	3.00%	0.00%
VeriSign Inc	VRSN	106.02	199.81	21,183.06	0.07%			11.00%	0.01%
Quanta Services Inc	PWR	142.90	149.88	21,418.00	0.07%	0.19%	0.00%	12.50%	0.01%
Henry Schein Inc	HSIC	135.55	80.92	10,968.54	0.04%			7.00%	0.00%
Ameren Corp	AEE	258.37	89.32	23,077.70	0.08%	2.64%	0.00%	6.50%	0.01%
ANSYS Inc	ANSS	87.11	254.30	22,152.58	0.08%			8.50%	0.01%
FactSet Research Systems Inc	FDS	38.10	461.29	17,574.23	0.06%	0.77%	0.00%	10.50%	0.01%
NVIDIA Corp	NVDA	2,460.00	169.23	416,305.80		0.09%		23.00%	
Sealed Air Corp	SEE	144.66	53.03	7,671.21	0.03%	1.51%	0.00%	10.00%	0.00%
Cognizant Technology Solutions Corp	CTSH	513.92	62.21	31,971.03	0.11%	1.74%	0.00%	8.00%	0.01%
SVB Financial Group	SIVB	59.10	231.78	13,699.13	0.05%			8.50%	0.00%
Intuitive Surgical Inc	ISRG	353.39	270.39	95,551.77	0.33%			12.50%	0.04%
Take-Two Interactive Software Inc	TTWO	167.82	105.69	17,736.79	0.06%			8.00%	0.00%
Republic Services Inc	RSG	316.00	139.29	44,015.78	0.15%	1.42%	0.00%	12.50%	0.02%
eBay Inc	EBAY	542.66	45.44	24,658.42	0.09%	1.94%	0.00%	15.50%	0.01%
Goldman Sachs Group Inc/The	GS	338.64	386.15	130,763.91	0.45%	2.59%	0.01%	5.00%	0.02%
SBA Communications Corp	SBAC	107.97	299.30	32,314.22		0.95%		35.50%	
Sempra Energy	SRE	314.33	166.19	52,239.00	0.18%	2.76%	0.01%	7.00%	0.01%
Moody's Corp	MCO	183.20	298.27	54,643.06	0.19%	0.94%	0.00%	4.00%	0.01%
ON Semiconductor Corp	ON	432.42	75.20	32,518.28				22.50%	
Booking Holdings Inc	BKNG	38.79	2,079.45	80,659.79				22.00%	
F5 Inc	FFIV	60.37	154.61	9,333.65	0.03%			10.00%	0.00%
Akamai Technologies Inc	AKAM	157.24	94.86	14,915.98	0.05%			5.50%	0.00%
Charles River Laboratories International Inc	CRL	50.88	228.57	11,629.41	0.04%			12.00%	0.00%
MarketAxess Holdings Inc	MKTX	37.64	267.92	10,083.71	0.04%	1.05%	0.00%	11.00%	0.00%
Devon Energy Corp	DVN	653.70	68.52	44,791.52		7.88%		33.50%	
Bio-Techne Corp	TECH	156.97	84.99	13,340.88	0.05%	0.38%	0.00%	14.50%	0.01%
Alphabet Inc	GOOGL	5,973.00	100.99	603,213.27					
Teleflex Inc	TFX	46.91	234.12	10,981.63	0.04%	0.58%	0.00%	10.00%	0.00%
Netflix Inc	NFLX	445.02	305.53	135,966.96	0.47%			14.50%	0.07%
Allegion plc	ALLE	87.85	113.65	9,983.58	0.03%	1.44%	0.00%	10.50%	0.00%
Agilent Technologies Inc	A	295.00	154.98	45,719.10	0.16%	0.58%	0.00%	12.00%	0.02%
Warner Bros Discovery Inc	WBD	2,428.40	11.40	27,683.71					
Elevance Health Inc	ELV	238.83	532.92	127,276.22	0.44%	0.96%	0.00%	12.50%	0.06%
Trimble Inc	TRMB	246.63	59.75	14,735.84	0.05%			10.00%	0.01%
CME Group Inc	CME	359.73	176.50	63,491.46	0.22%	2.27%	0.01%	8.50%	0.02%
Juniper Networks Inc	JNPR	324.56	33.24	10,788.24	0.04%	2.53%	0.00%	9.00%	0.00%
BlackRock Inc	BLK	150.20	716.00	107,540.34	0.37%	2.73%	0.01%	10.00%	0.04%
DTE Energy Co	DTE	193.74	116.01	22,476.01	0.08%	3.28%	0.00%	4.50%	0.00%
Nasdaq Inc	NDAQ	491.28	68.26	33,534.77	0.12%	1.17%	0.00%	6.00%	0.01%
Celanese Corp	CE	108.43	107.30	11,634.32	0.04%	2.61%	0.00%	7.50%	0.00%
Philip Morris International Inc	PM	1,550.20	99.67	154,508.63	0.54%	5.10%	0.03%	5.00%	0.03%
Salesforce Inc	CRM	1,000.00	160.25	160,250.00	0.56%			19.50%	0.11%
Ingersoll Rand Inc	IR	404.93	53.97	21,853.86		0.15%			
Huntington Ingalls Industries Inc	HII	39.90	231.96	9,256.13	0.03%	2.14%	0.00%	10.00%	0.00%
MetLife Inc	MET	784.61	76.70	60,179.28	0.21%	2.61%	0.01%	7.50%	0.02%
Tapestry Inc	TPR	240.96	37.77	9,101.10	0.03%	3.18%	0.00%	15.00%	0.00%
CSX Corp	CSX	2,102.41	32.69	68,727.75	0.24%	1.22%	0.00%	10.50%	0.03%
Edwards Lifesciences Corp	EW	618.26	77.25	47,760.59	0.17%			11.00%	0.02%
Ameriprise Financial Inc	AMP	106.42	331.95	35,325.12	0.12%	1.51%	0.00%	15.00%	0.02%
Zebra Technologies Corp	ZBRA	51.63	270.28	13,954.56	0.05%			11.50%	0.01%
Zimmer Biomet Holdings Inc	ZBH	209.85	120.10	25,203.23	0.09%	0.80%	0.00%	5.50%	0.00%
CBRE Group Inc	CBRE	315.95	79.60	25,149.54	0.09%			8.50%	0.01%
Camden Property Trust	CPT	106.53	120.33	12,818.51	0.04%	3.12%	0.00%	4.50%	0.00%
Mastercard Inc	MA	953.80	356.40	339,935.39	1.18%	0.55%	0.01%	18.50%	0.22%
CarMax Inc	KMX	158.02	69.36	10,959.92	0.04%			4.00%	0.00%
Intercontinental Exchange Inc	ICE	558.55	108.31	60,496.77	0.21%	1.40%	0.00%	6.50%	0.01%
Fidelity National Information Services Inc	FIS	593.38	72.58	43,067.45		2.59%		52.00%	
Chipotle Mexican Grill Inc	CMG	27.72	1,626.96	45,100.96				23.00%	
Wynn Resorts Ltd	WYNN	113.31	83.66	9,479.85				27.00%	
Live Nation Entertainment Inc	LYV	230.88	72.76	16,798.83					
Assurant Inc	AIZ	52.83	128.22	6,773.99	0.02%	2.18%	0.00%	15.50%	0.00%
NRG Energy Inc	NRG	230.38	42.45	9,779.80		3.30%		-10.50%	
Regions Financial Corp	RF	934.45	23.21	21,688.49	0.08%	3.45%	0.00%	11.50%	0.01%
Monster Beverage Corp	MNST	521.74	102.86	53,666.59	0.19%			10.50%	0.02%
Mosaic Co/The	MOS	340.48	51.30	17,466.68		1.17%		38.00%	
Baker Hughes Co	BKR	1,001.47	29.02	29,062.60		2.62%			
Expedia Group Inc	EXPE	150.57	106.84	16,086.58					
Evergy Inc	EVRG	229.48	59.21	13,587.39	0.05%	4.14%	0.00%	7.50%	0.00%
CF Industries Holdings Inc	CF	196.19	108.19	21,225.69		1.48%		32.00%	
Leidos Holdings Inc	LDOS	136.69	109.33	14,944.32	0.05%	1.32%	0.00%	8.50%	0.00%
APA Corp	APA	321.51	46.85	15,062.84		2.13%			
Alphabet Inc	GOOG	6,086.00	101.45	617,424.70	2.15%			18.50%	0.40%
TE Connectivity Ltd	TEL	317.23	126.12	40,009.17	0.14%	1.78%	0.00%	10.50%	0.01%
Cooper Cos Inc/The	COO	49.35	316.35	15,610.61	0.05%	0.02%	0.00%	14.00%	0.01%
Discover Financial Services	DFS	273.23	108.36	29,606.77	0.10%	2.21%	0.00%	16.00%	0.02%
Visa Inc	V	1,628.17	217.00	353,312.67	1.23%	0.83%	0.01%	13.50%	0.17%
Mid-America Apartment Communities Inc	MAA	115.48	164.88	19,039.85	0.07%	3.03%	0.00%	4.50%	0.00%
Xylem Inc/NY	XYL	180.22	112.35	20,247.94	0.07%	1.07%	0.00%	9.00%	0.01%
Marathon Petroleum Corp	MPC	468.66	121.81	57,087.60		2.46%			
Tractor Supply Co	TSCO	110.46	226.31	24,998.88	0.09%	1.63%	0.00%	12.50%	0.01%
Advanced Micro Devices Inc	AMD	1,612.36	77.63	125,167.20				25.50%	
ResMed Inc	RMD	146.48	230.20	33,720.62	0.12%	0.76%	0.00%	8.50%	0.01%
Mettler-Toledo International Inc	MTD	22.29	1,469.56	32,762.37	0.11%			13.50%	0.02%
VICI Properties Inc	VICI	997.37	34.20	34,110.16	0.12%	4.56%	0.01%	8.50%	0.01%
Copart Inc	CPRT	476.30	66.56	31,702.53	0.11%			7.00%	0.01%
Jacobs Solutions Inc	J	126.33	126.54	15,986.05	0.06%	0.73%	0.00%	12.00%	0.01%
Albemarle Corp	ALB	117.15	277.99	32,567.36		0.57%		21.50%	
Fortinet Inc	FTNT	781.24	53.16	41,530.51				21.50%	

STANDARD AND POOR'S 500 INDEX

Name	Ticker	[4] Shares Outst'g	[5] Price	[6] Market Capitalization	[7] Weight in Index	[8] Estimated Dividend Yield	[9] Cap-Weighted Dividend Yield	[10] Value Line Long-Term Growth Est.	[11] Cap-Weighted Long-Term Growth Est.
Moderna Inc	MRNA	384.18	175.91	67,581.10				-2.50%	
Essex Property Trust Inc	ESS	64.75	220.38	14,270.49		3.99%		-4.00%	
CoStar Group Inc	CSGP	406.69	81.04	32,958.16	0.11%			13.00%	0.01%
Realty Income Corp	O	627.15	63.07	39,554.60	0.14%	4.72%	0.01%	6.00%	0.01%
Westrock Co	WRK	254.46	37.92	9,649.27	0.03%	2.90%	0.00%	20.00%	0.01%
Westinghouse Air Brake Technologies Corp	WAB	181.87	101.09	18,385.04	0.06%	0.59%	0.00%	9.50%	0.01%
Pool Corp	POOL	39.05	329.41	12,863.79	0.04%	1.21%	0.00%	14.00%	0.01%
Western Digital Corp	WDC	317.65	36.75	11,673.64	0.04%			20.00%	0.01%
PepsiCo Inc	PEP	1,377.71	184.36	253,994.43	0.88%	2.50%	0.02%	6.00%	0.05%
Diamondback Energy Inc	FANG	181.86	148.02	26,918.77		6.11%			
ServiceNow Inc	NOW	202.00	416.30	84,092.60				45.50%	
Church & Dwight Co Inc	CHD	243.87	81.87	19,965.47	0.07%	1.28%	0.00%	6.00%	0.00%
Federal Realty Investment Trust	FRT	81.21	111.10	9,022.32	0.03%	3.89%	0.00%	2.50%	0.00%
MGM Resorts International	MGM	384.02	36.86	14,154.98		0.03%		25.00%	
American Electric Power Co Inc	AEP	513.86	96.80	49,742.04	0.17%	3.43%	0.01%	6.50%	0.01%
SolarEdge Technologies Inc	SEDG	55.90	298.86	16,704.78				22.00%	
Invitation Homes Inc	INVH	611.41	32.63	19,950.31		2.70%			
PTC Inc	PTC	117.47	127.21	14,943.61				29.00%	
JB Hunt Transport Services Inc	JBHT	103.54	183.89	19,039.42	0.07%	0.87%	0.00%	11.50%	0.01%
Lam Research Corp	LRCX	136.38	472.38	64,422.71	0.22%	1.46%	0.00%	20.00%	0.04%
Mohawk Industries Inc	MHK	63.53	101.33	6,437.90	0.02%			10.00%	0.00%
Pentair PLC	PNR	164.50	45.77	7,529.07	0.03%	1.84%	0.00%	13.00%	0.00%
Vertex Pharmaceuticals Inc	VRTX	256.69	316.40	81,217.03	0.28%			12.50%	0.04%
Amcor PLC	AMCR	1,489.02	12.35	18,389.40	0.06%	3.97%	0.00%	14.50%	0.01%
Meta Platforms Inc	META	2,248.67	118.10	265,568.16	0.92%			13.00%	0.12%
T-Mobile US Inc	TMUS	1,244.15	151.46	188,439.56	0.66%			10.00%	0.07%
United Rentals Inc	URI	69.31	353.03	24,467.80	0.09%			18.00%	0.02%
ABIOMED Inc	ABMD	45.09	377.79	17,034.93	0.06%			7.50%	0.00%
Honeywell International Inc	HON	672.32	219.55	147,608.30	0.51%	1.88%	0.01%	11.00%	0.06%
Alexandria Real Estate Equities Inc	ARE	164.09	155.61	25,533.58	0.09%	3.03%	0.00%	10.00%	0.01%
Delta Air Lines Inc	DAL	641.19	35.37	22,678.82					
Seagate Technology Holdings PLC	STX	206.45	52.97	10,935.87	0.04%	5.29%	0.00%	15.00%	0.01%
United Airlines Holdings Inc	UAL	326.73	44.17	14,431.62					
News Corp	NWS	193.28	19.45	3,759.22		1.03%			
Centene Corp	CNC	566.26	87.05	49,292.93	0.17%			10.00%	0.02%
Martin Marietta Materials Inc	MLM	62.09	366.48	22,755.11	0.08%	0.72%	0.00%	5.50%	0.00%
Teradyne Inc	TER	155.76	93.45	14,555.40	0.05%	0.47%	0.00%	8.50%	0.00%
PayPal Holdings Inc	PYPL	1,140.03	78.41	89,389.60	0.31%			12.00%	0.04%
Tesla Inc	TSLA	3,157.75	194.70	614,814.31				51.50%	
Arch Capital Group Ltd	ACGL	369.87	59.91	22,159.09	0.08%			19.50%	0.02%
DISH Network Corp	DISH	292.27	16.05	4,690.95	0.02%			2.50%	0.00%
Dow Inc	DOW	703.76	50.97	35,870.60	0.12%	5.49%	0.01%	15.00%	0.02%
Everest Re Group Ltd	RE	39.17	337.94	13,235.42	0.05%	1.95%	0.00%	9.50%	0.00%
Teledyne Technologies Inc	TDY	46.87	420.10	19,690.51	0.07%			11.50%	0.01%
News Corp	NWSA	382.35	19.15	7,322.02		1.04%			
Exelon Corp	EXC	991.76	41.37	41,028.99		3.26%			
Global Payments Inc	GPN	270.40	103.78	28,062.22	0.10%	0.96%	0.00%	17.00%	0.02%
Crown Castle Inc	CCI	433.05	141.43	61,245.98	0.21%	4.43%	0.01%	12.00%	0.03%
Aptiv PLC	APTV	270.95	106.67	28,902.24				26.00%	
Advance Auto Parts Inc	AAP	59.25	150.99	8,946.76	0.03%	3.97%	0.00%	15.50%	0.00%
Align Technology Inc	ALGN	78.11	196.66	15,361.51	0.05%			17.00%	0.01%
Illumina Inc	ILMN	157.30	218.08	34,303.98	0.12%			6.50%	0.01%
Targa Resources Corp	TRGP	226.38	74.39	16,840.04		1.88%			
LKQ Corp	LKQ	267.18	54.33	14,515.62	0.05%	2.02%	0.00%	13.00%	0.01%
Zoetis Inc	ZTS	466.07	154.14	71,840.34	0.25%	0.84%	0.00%	11.00%	0.03%
Equinix Inc	EQIX	92.54	690.65	63,911.37	0.22%	1.80%	0.00%	15.00%	0.03%
Digital Realty Trust Inc	DLR	287.52	112.46	32,334.72		4.34%		-3.50%	
Las Vegas Sands Corp	LVS	764.17	46.84	35,793.54	0.12%			13.50%	0.02%
Molina Healthcare Inc	MOH	58.40	336.77	19,667.37	0.07%			11.00%	0.01%

Notes:
[1] Equals sum of Col. [9]
[2] Equals sum of Col. [11]
[3] Equals ([1] x (1 + (0.5 x [2]))) + [2]
[4] Source: Bloomberg Professional as of November 30, 2022
[4] Source: Bloomberg Professional as of November 30, 2022
[6] Equals [4] x [5]
[7] Equals weight in S&P 500 based on market capitalization [6] if Growth Rate >0% and≤20%
[4] Source: Bloomberg Professional as of November 30, 2022
[9] Equals [7] x [8]
[10] Source: Value Line, as of November 30, 2022
[11] Equals [7] x [10]

Mr. Jennings's *As-Filed*
Growth Rate Comparison

		Q2/2022 Projected Growth Rates			
		EPS	DPS	BVPS	Average
American Water Works Company Inc.	AWK	3.00%	8.50%	8.00%	6.50%
American States Water Company	AWR	5.50%	9.00%	5.50%	6.67%
California Water Service Group	CWT	6.50%	6.50%	5.00%	6.00%
Middlesex Water Company	MSEX	4.50%	5.00%	2.50%	4.00%
SJW Group	SJW	14.00%	5.50%	4.00%	7.83%
Essential Utilities, Inc.	WTRG	10.00%	8.00%	6.00%	8.00%
Average		7.25%	7.08%	5.17%	**6.50%**

Source: Exhibit RTJ-d11

		Q1/2021 Projected Growth Rates			
		EPS	DPS	BVPS	Average
American Water Works Company Inc.	AWK	8.50%	8.50%	5.00%	7.33%
American States Water Company	AWR	6.50%	9.50%	5.50%	7.17%
California Water Service Group	CWT	6.50%	6.50%	4.00%	5.67%
Middlesex Water Company	MSEX	4.50%	5.50%	2.50%	4.17%
SJW Group	SJW	13.00%	6.00%	4.50%	7.83%
Essential Utilities, Inc.	WTRG	10.00%	7.50%	4.50%	7.33%
Average		8.17%	7.25%	4.33%	**6.58%**

Source: Exhibit RTJ-d11

Mr. Jennings's *As-Corrected*
Growth Rate Comparison

		Q2/2022 Projected Growth Rates				
		EPS	DPS	BVPS	Average	VL Report Dates
American Water Works Company Inc.	AWK	7.50%	9.00%	8.00%	8.17%	2022.04.08
American States Water Company	AWR	5.50%	9.00%	5.50%	6.67%	2022.04.08
California Water Service Group	CWT	6.50%	6.50%	4.00%	5.67%	2022.04.08
Middlesex Water Company	MSEX	4.50%	5.00%	2.00%	3.83%	2022.04.08
SJW Group	SJW	14.00%	5.50%	4.00%	7.83%	2022.04.08
Essential Utilities, Inc.	WTRG	10.00%	8.00%	6.00%	8.00%	2022.04.08
Average		8.00%	7.17%	4.92%	**6.69%**	

Source: Exhibit RTJ-d11, as corrected for data available as of 2Q/2022

		Q1/2021 Projected Growth Rates			
		EPS	DPS	BVPS	Average
American Water Works Company Inc.	AWK	8.50%	8.50%	5.00%	7.33%
American States Water Company	AWR	6.50%	9.50%	5.50%	7.17%
California Water Service Group	CWT	6.50%	6.50%	4.00%	5.67%
Middlesex Water Company	MSEX	4.50%	5.50%	2.50%	4.17%
SJW Group	SJW	13.00%	6.00%	4.50%	7.83%
Essential Utilities, Inc.	WTRG	10.00%	7.50%	4.50%	7.33%
Average		8.17%	7.25%	4.33%	**6.58%**

Source: Exhibit RTJ-d11

Mr. Jennings's *As-Updated*
Growth Rate Comparison

		As of November 30, 2022 Projected Growth Rates				
		EPS	DPS	BVPS	Average	VL Report Dates
American Water Works Company Inc.	AWK	3.00%	8.50%	8.50%	6.67%	2022.10.07
American States Water Company	AWR	5.50%	9.00%	9.00%	7.83%	2022.10.07
California Water Service Group	CWT	6.50%	6.50%	6.50%	6.50%	2022.10.07
Middlesex Water Company	MSEX	4.50%	5.00%	5.00%	4.83%	2022.10.07
SJW Group	SJW	14.00%	5.50%	5.50%	8.33%	2022.10.07
Essential Utilities, Inc.	WTRG	10.00%	8.00%	8.00%	8.67%	2022.10.07
Average		7.25%	7.08%	7.08%	**7.14%**	

Source: Exhibit RTJ-d11, as updated for data available as of November 30, 20222

		Q1/2021 Projected Growth Rates			
		EPS	DPS	BVPS	Average
American Water Works Company Inc.	AWK	8.50%	8.50%	5.00%	7.33%
American States Water Company	AWR	6.50%	9.50%	5.50%	7.17%
California Water Service Group	CWT	6.50%	6.50%	4.00%	5.67%
Middlesex Water Company	MSEX	4.50%	5.50%	2.50%	4.17%
SJW Group	SJW	13.00%	6.00%	4.50%	7.83%
Essential Utilities, Inc.	WTRG	10.00%	7.50%	4.50%	7.33%
Average		8.17%	7.25%	4.33%	**6.58%**

Source: Exhibit RTJ-d11

Mr. Jennings's *As-Filed*
Average High / Low Stock Price Comparison

	Q2/2022		[1] April 2022		[2] April 2022		[3] May 2022		[4] May 2022		[5] June 2022		[6] June 2022		[7]
	Company Name	Ticker	Avg High Stock Price		Avg Low Stock Price		Avg High Stock Price		Avg Low Stock Price		Avg High Stock Price		Avg Low Stock Price		Average High/Low Stock Price
1	American States Water Co	AWR	$	87.44	$	85.28	$	78.75	$	76.73	$	78.55	$	76.51	$ 80.54
2	American Water Works Company Inc.	AWK	$	167.19	$	163.38	$	149.21	$	145.62	$	147.28	$	143.12	$ 152.63
3	California Water Service Group	CWT	$	57.42	$	55.85	$	53.17	$	51.76	$	53.50	$	52.02	$ 53.95
4	Essential Utilities Inc.	WTRG	$	50.19	$	49.10	$	45.62	$	44.42	$	45.43	$	44.30	$ 46.51
5	Middlesex Water Company	MSEX	$	99.45	$	96.38	$	89.43	$	86.60	$	85.40	$	82.58	$ 89.97
6	SJW Group	SJW	$	66.37	$	64.59	$	60.92	$	59.23	$	61.10	$	59.51	$ 61.95
7														Average	**$ 80.93**

	Q1/2021		[1] January 2021		[2] January 2021		[3] February 2021		[4] February 2021		[5] March 2021		[6] March 2021		[7]
	Company Name	Ticker	Avg High Stock Price		Avg Low Stock Price		Avg High Stock Price		Avg Low Stock Price		Avg High Stock Price		Avg Low Stock Price		Average High/Low Stock Price
1	American States Water Co	AWR	$	81.04	$	79.28	$	79.94	$	78.06	$	73.79	$	72.27	$ 77.40
2	American Water Works Company Inc.	AWK	$	159.26	$	155.40	$	161.01	$	157.56	$	142.22	$	138.84	$ 152.38
3	California Water Service Group	CWT	$	55.64	$	54.15	$	58.16	$	56.74	$	54.65	$	53.52	$ 55.48
4	Essential Utilities Inc.	WTRG	$	47.30	$	46.07	$	46.87	$	45.89	$	43.49	$	42.56	$ 45.36
5	Middlesex Water Company	MSEX	$	74.72	$	71.96	$	79.41	$	76.55	$	76.94	$	74.59	$ 75.70
6	SJW Group	SJW	$	68.71	$	66.79	$	68.82	$	66.98	$	61.69	$	60.25	$ 65.54
7														Average	**$ 78.64**

Percentage Increase Since 2021 Spire Case: 2.91%

Notes:
[1] - [6]: Wall Street Journal, https://www.wsj.com/market-data
[7] = Average of [1] through [6]

Mr. Jennings's *As Updated*
Average High / Low Stock Price Comparison

			[1]	[2]	[3]	[4]	[5]	[6]	[7]
	Through November 30, 2022		September 2022		October 2022		November 2022		
	Company Name	Ticker	Avg High Stock Price	Avg Low Stock Price	Avg High Stock Price	Avg Low Stock Price	Avg High Stock Price	Avg Low Stock Price	Average High/Low Stock Price
1	American States Water Co	AWR	$ 85.11	$ 82.88	$ 85.08	$ 82.53	$ 95.08	$ 92.63	$ 87.22
2	American Water Works Company Inc.	AWK	$ 148.10	$ 144.45	$ 135.28	$ 131.96	$ 146.65	$ 143.10	$ 141.59
3	California Water Service Group	CWT	$ 58.40	$ 56.82	$ 56.37	$ 54.55	$ 62.91	$ 61.41	$ 58.41
4	Essential Utilities Inc.	WTRG	$ 46.70	$ 45.68	$ 42.34	$ 41.16	$ 46.65	$ 45.68	$ 44.70
5	Middlesex Water Company	MSEX	$ 87.52	$ 85.12	$ 83.57	$ 80.34	$ 91.57	$ 89.15	$ 86.21
6	SJW Group	SJW	$ 63.80	$ 62.26	$ 63.80	$ 62.10	$ 72.95	$ 71.28	$ 66.03
7								Average	**$ 80.69**

			[8]	[9]	[10]	[11]	[12]	[13]	[14]
	Q1/2021		January 2021		February 2021		March 2021		
	Company Name	Ticker	Avg High Stock Price	Avg Low Stock Price	Avg High Stock Price	Avg Low Stock Price	Avg High Stock Price	Avg Low Stock Price	Average High/Low Stock Price
8	American States Water Co	AWR	$ 81.04	$ 79.28	$ 79.94	$ 78.06	$ 73.79	$ 72.27	$ 77.40
9	American Water Works Company Inc.	AWK	$ 159.26	$ 155.40	$ 161.01	$ 157.56	$ 142.22	$ 138.84	$ 152.38
10	California Water Service Group	CWT	$ 55.64	$ 54.15	$ 58.16	$ 56.74	$ 54.65	$ 53.52	$ 55.48
11	Essential Utilities Inc.	WTRG	$ 47.30	$ 46.07	$ 46.87	$ 45.89	$ 43.49	$ 42.56	$ 45.36
12	Middlesex Water Company	MSEX	$ 74.72	$ 71.96	$ 79.41	$ 76.55	$ 76.94	$ 74.59	$ 75.70
13	SJW Group	SJW	$ 68.71	$ 66.79	$ 68.82	$ 66.98	$ 61.69	$ 60.25	$ 65.54
14								Average	**$ 78.64**

Percentage Increase Since 2021 Spire Case: 2.61%

Notes:
[1] - [6]: Bloomberg
[7] = Average of [1] through [6]
[8] - [13]: Wall Street Journal, https://www.wsj.com/market-data
[14] = Average of [8] through [13]

Mr. Jennings's *As-Filed* Comparitive DCF Analysis

2022 Q2 DCF COE estimate

Water Utility Companies	Ticker	[1] 2021 Dividend per Share	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Projected Growth	[6] Projected GDP Growth	[7] Growth Rate	[8] COE
American States Water Co	AWR	$1.40	$80.54	1.74%	1.79%	6.67%	3.90%	6.11%	7.90%
American Water Works Company Inc.	AWK	$2.36	$152.63	1.55%	1.59%	6.50%	3.90%	5.98%	7.57%
California Water Service Group	CWT	$0.92	$53.95	1.71%	1.75%	6.00%	3.90%	5.58%	7.33%
Essential Utilities Inc.	WTRG	$1.04	$46.51	2.24%	2.32%	8.00%	3.90%	7.18%	9.50%
Middlesex Water Company	MSEX	$1.11	$89.97	1.23%	1.26%	4.00%	3.90%	3.98%	5.24%
SJW Group	SJW	$1.36	$61.95	2.20%	2.27%	7.83%	3.90%	7.05%	9.32%
Average		1.37	80.93	1.78%	1.83%	6.50%	3.90%	5.98%	7.81%
								DCF Lower Bound	7.60%
								DCF Upper Bound	8.27%
								DCF COE	7.93%

2021 Q1 DCF COE estimate

Water Utility Companies	Ticker	[1] 2021 Dividend per Share	[2] Stock Price	[3] Dividend Yield	[4] Expected Dividend Yield	[5] Projected Growth	[6] Projected GDP Growth	[7] Growth Rate	[8] COE
American States Water Co	AWR	1.28	77.40	1.65%	1.71%	7.17%	3.80%	6.50%	8.20%
American Water Works Company Inc.	AWK	2.15	152.38	1.41%	1.46%	7.33%	3.80%	6.62%	8.08%
California Water Service Group	CWT	0.85	55.48	1.53%	1.57%	5.67%	3.80%	5.30%	6.87%
Essential Utilities Inc.	WTRG	0.97	45.36	2.14%	2.21%	7.33%	3.80%	6.62%	8.83%
Middlesex Water Company	MSEX	1.04	75.70	1.37%	1.40%	4.17%	3.80%	4.10%	5.50%
SJW Group	SJW	1.28	65.54	1.95%	2.02%	7.83%	3.80%	7.02%	9.05%
Average		1.26	78.64	1.68%	1.73%	6.58%	3.80%	6.03%	7.76%
								DCF Lower Bound	7.72%
								DCF Upper Bound	8.37%
								DCF COE	8.05%

2021 Q1 DCF COE estimate	8.05%
2022 Q2 DCF COE estimate	7.93%
Difference of Averages between Q1 2021 and Q4 2021	-0.11%

Mr. Jennings's *As-Updated* Comparitive DCF Analysis

2022 November DCF COE estimate		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Water Utility Companies	Ticker	Annualized Dividend	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Growth	Projected GDP Growth	Growth Rate	COE
American States Water Co	AWR	$1.59	$87.22	1.82%	1.88%	6.67%	3.90%	6.11%	7.99%
American Water Works Company Inc.	AWK	$2.62	$141.59	1.85%	1.92%	7.83%	3.90%	7.05%	8.96%
California Water Service Group	CWT	$1.00	$58.41	1.71%	1.76%	6.50%	3.90%	5.98%	7.74%
Essential Utilities Inc.	WTRG	$1.15	$44.70	2.57%	2.63%	4.83%	3.90%	4.65%	7.27%
Middlesex Water Company	MSEX	$1.25	$86.21	1.45%	1.50%	8.33%	3.90%	7.45%	8.95%
SJW Group	SJW	$1.44	$66.03	2.18%	2.26%	8.67%	3.90%	7.71%	9.98%
Average		1.51	80.69	1.93%	1.99%	7.14%	3.90%	6.49%	8.48%
								DCF Lower Bound	8.23%
								DCF Upper Bound	8.63%
								DCF COE	8.43%

2021 Q1 DCF COE estimate		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Water Utility Companies	Ticker	2021 Dividend per Share	Stock Price	Dividend Yield	Expected Dividend Yield	Projected Growth	Projected GDP Growth	Growth Rate	COE
American States Water Co	AWR	1.28	77.40	1.65%	1.71%	7.17%	3.80%	6.50%	8.20%
American Water Works Company Inc.	AWK	2.15	152.38	1.41%	1.46%	7.33%	3.80%	6.62%	8.08%
California Water Service Group	CWT	0.85	55.48	1.53%	1.57%	5.67%	3.80%	5.30%	6.87%
Essential Utilities Inc.	WTRG	0.97	45.36	2.14%	2.21%	7.33%	3.80%	6.62%	8.83%
Middlesex Water Company	MSEX	1.04	75.70	1.37%	1.40%	4.17%	3.80%	4.10%	5.50%
SJW Group	SJW	1.28	65.54	1.95%	2.02%	7.83%	3.80%	7.02%	9.05%
Average		1.26	78.64	1.68%	1.73%	6.58%	3.80%	6.03%	7.76%
								DCF Lower Bound	7.72%
								DCF Upper Bound	8.37%
								DCF COE	8.05%

2021 Q1 DCF COE estimate	8.05%
2022 Oct DCF COE estimate	8.43%
Difference of Averages between Q1 2021 and Oct 2022	0.39%

Mr. Jennings *As-Filed* Comparative CAPM Analysis

Q2/2022 CAPM Estimate	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
			Kroll, LLC (1926-2021)				NYU Stern (1928-2021)				Market Risk Premium				CAPM Cost of Common Equity			
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Kroll, LLC		NYU Stern		Kroll, LLC		NYU Stern	
	Risk-Free		Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean
Water Utility Companies	Rate	Beta	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return
1 American States Water Co	3.04%	0.65	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.04%	6.96%	6.38%	7.40%
2 American Water Works Company Inc.	3.04%	0.85	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.96%	8.17%	7.41%	8.75%
3 California Water Service Group	3.04%	0.65	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.04%	6.96%	6.38%	7.40%
4 Essential Utilities Inc.	3.04%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.42%	8.77%	7.92%	9.42%
5 Middlesex Water Company	3.04%	0.70	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.27%	7.26%	6.64%	7.74%
6 SJW Group	3.04%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.73%	7.87%	7.15%	8.41%
Average	3.04%	0.77	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.58%	7.67%	6.98%	8.19%
															CAPM Lower Bound			6.23%
															CAPM Upper Bound			8.64%
																Average		7.44%

Q1/2021 Q1 CAPM Estimate	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
			Kroll, LLC (1926-2020)				NYU Stern (1928-2020)				Market Risk Premium				CAPM Cost of Common Equity			
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Kroll, LLC		NYU Stern		Kroll, LLC		NYU Stern	
	Risk-Free		Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean	Geometric Mean	Arithmetic Mean
Water Utility Companies	Rate	Beta	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return	Return
1 American States Water Co	2.07%	0.65	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.08%	6.01%	5.22%	6.25%
2 American Water Works Company Inc.	2.07%	0.85	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.00%	7.23%	6.18%	7.53%
3 California Water Service Group	2.07%	0.65	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.08%	6.01%	5.22%	6.25%
4 Essential Utilities Inc.	2.07%	0.95	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.47%	7.84%	6.67%	8.17%
5 Middlesex Water Company	2.07%	0.70	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.31%	6.32%	5.46%	6.57%
6 SJW Group	2.07%	0.85	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.00%	7.23%	6.18%	7.53%
Average	2.07%	0.78	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.66%	6.77%	5.82%	7.05%
															CAPM Lower Bound			5.17%
															CAPM Upper Bound			7.63%
																Average		6.40%

Notes:

[1] 3-month average of 30-Year Treasury bond yield, April through June 2022
[2] Value Line, Investment Survey.
[3] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[4] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[5] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[6] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[7] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[8] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[9] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[10] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[11] = [3] - [5]
[12] = [4] - [6]
[13] = [7] - [9]
[14] = [8] - [10]
[15] = [1] + [2] x [11]
[16] = [1] + [2] x [12]
[17] = [1] + [2] x [13]
[18] = [1] + [2] x [14]

2021 Q1 CAPM COE estimate	6.40%
2022 Q2 CAPM COE estimate	7.44%
Difference of Averages between 2021 Q1 and 2022 Q2	1.03%

Mr. Jennings *As-Updated* Comparative CAPM Analysis

Sep-Nov 2022 CAPM Estimate	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
			Kroll, LLC (1926-2021)				NYU Stern (1928-2021)				Market Risk Premium				CAPM Cost of Common Equity			
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Kroll, LLC		NYU Stern		Kroll, LLC		NYU Stern	
Water Utility Companies	Risk-Free Rate	Beta	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return
American States Water Co	3.86%	0.65	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	6.86%	7.78%	7.20%	8.22%
American Water Works Company Inc.	3.86%	0.90	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	8.01%	9.29%	8.48%	9.90%
California Water Service Group	3.86%	0.70	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.09%	8.08%	7.45%	8.56%
Essential Utilities Inc.	3.86%	0.95	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	8.24%	9.59%	8.74%	10.23%
Middlesex Water Company	3.86%	0.70	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.09%	8.08%	7.45%	8.56%
SJW Group	3.86%	0.80	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.55%	8.68%	7.97%	9.23%
Average	3.86%	0.78	10.46%	12.33%	5.85%	6.30%	9.98%	11.82%	4.84%	5.11%	4.61%	6.03%	5.13%	6.71%	7.47%	8.58%	7.88%	9.12%
																CAPM Lower Bound		7.12%
																CAPM Upper Bound		9.59%
																Average		8.36%

Q1/2021 CAPM Estimate	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	[15]	[16]	[17]	[18]
			Kroll, LLC (1926-2020)				NYU Stern (1928-2020)				Market Risk Premium				CAPM Cost of Common Equity			
			Large Company Stocks		Long-term G-Bonds		S&P 500		US Treasury Bond		Kroll, LLC		NYU Stern		Kroll, LLC		NYU Stern	
Water Utility Companies	Risk-Free Rate	Beta	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return	Geometric Mean Return	Arithmetic Mean Return
American States Water Co	2.07%	0.65	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.08%	6.01%	5.22%	6.25%
American Water Works Company Inc.	2.07%	0.85	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.00%	7.23%	6.18%	7.53%
California Water Service Group	2.07%	0.65	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.08%	6.01%	5.22%	6.25%
Essential Utilities Inc.	2.07%	0.95	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.47%	7.84%	6.67%	8.17%
Middlesex Water Company	2.07%	0.70	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.31%	6.32%	5.46%	6.57%
SJW Group	2.07%	0.85	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	6.00%	7.23%	6.18%	7.53%
Average	2.07%	0.78	10.29%	12.16%	5.65%	6.08%	9.79%	11.64%	4.95%	5.21%	4.63%	6.07%	4.84%	6.43%	5.66%	6.77%	5.82%	7.05%
																CAPM Lower Bound		5.17%
																CAPM Upper Bound		7.63%
																Average		6.40%

Notes:

[1] 3-month average of 30-Year Treasury bond yield, **September through November 2022**
[2] Value Line, Investment Survey.
[3] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[4] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[5] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[6] Kroll, LLC, the Stocks, Bonds, Bills, and Inflation (SBBI®) Monthly Dataset.
[7] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[8] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[9] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[10] Risk Premium, Damodaran Online, Stern School of Business, NYU.
[11] = [3] - [5]
[12] = [4] - [6]
[13] = [7] - [9]
[14] = [8] - [10]
[15] = [1] + [2] x [11]
[16] = [1] + [2] x [12]
[17] = [1] + [2] x [13]
[18] = [1] + [2] x [14]

2021 Q1 CAPM COE estimate	6.40%
2022 Q2 CAPM COE estimate	8.36%
Difference of Averages between 2021 Q1 and 2022 Q2	1.96%

Mr. Jennings's *As-Filed*
Comparative ROE Analysis

		Cost of Equity	
Q2/2022 Estimate			
	DCF	7.93%	A
	CAPM	7.44%	B
	Average	**7.68%**	C
Q1/2021 Estimate			
	DCF	8.05%	D
	CAPM	6.40%	E
	Average	**7.22%**	F
Water Utility ROE Adjustment		0.46%	G
2021 National AVG ROE Water		9.46%	H
2021 National AVG ROE Natural Gas		9.56%	I
2021 Natural Gas to Water Adjustment		-0.10%	J
Last MO Authorized Gas ROE 2021 Q1		9.37%	K
Estimated ROE 2Q/2022		**9.73%**	L

Notes:

A Schedule RJ-d13
B Schedule RJ-d14
C Equals ([A] + [B]) / 2
D Schedule RJ-d13
E Schedule RJ-d14
F Equals ([D] + [E]) / 2
G Equals [C] - [F]
H Schedule RJ-d17
I Schedule RJ-d17
J Equals [H] - [I]
K Spire Missouri rate Case No. GR-2021-0108
L Equals [G] + [J] + [K]

Mr. Jennings's *As-Updated* Comparative ROE Analysis

	Cost of Equity	
Nov 30, 2022 Estimate		
DCF	8.43%	A
CAPM	8.36%	B
Average	**8.39%**	C
Q1/2021 Estimate		
DCF	8.05%	D
CAPM	6.40%	E
Average	**7.22%**	F
Water Utility ROE Adjustment	1.17%	G
2021 National AVG ROE Water	NA	H
2021 National AVG ROE Natural Gas	NA	I
2021 Natural Gas to Water Adjustment	NA	J
Last MO Authorized Gas ROE 2021 Q1	9.37%	K
Estimated ROE as of November 30, 2022	**10.54%**	L

Notes:

[A] Schedule RJ-d13
[B] Schedule RJ-d14
[C] Equals ([A] + [B]) / 2
[D] Schedule RJ-d13
[E] Schedule RJ-d14
[F] Equals ([D] + [E]) / 2
[G] Equals [C] - [F]
[H] Excluded; see discussion in Bulkley rebuttal testimony
[I] Excluded; see discussion in Bulkley rebuttal testimony
[J] Excluded; see discussion in Bulkley rebuttal testimony
[K] Spire Missouri rate Case No. GR-2021-0108
[L] Equals [G] + [J] + [K]

Historical Market Risk Premium, 1926-2021

Year	Large Co Stock Total Return Table A-1	Income Only Returns LT Govt Table A-7	Observed Equity Premium
1926	11.62%	3.73%	7.89%
1927	37.49%	3.41%	34.08%
1928	43.61%	3.22%	40.39%
1929	-8.42%	3.47%	-11.89%
1930	-24.90%	3.32%	-28.22%
1931	-43.34%	3.33%	-46.67%
1932	-8.19%	3.69%	-11.88%
1933	53.99%	3.12%	50.87%
1934	-1.44%	3.18%	-4.62%
1935	47.67%	2.81%	44.86%
1936	33.92%	2.77%	31.15%
1937	-35.03%	2.66%	-37.69%
1938	31.12%	2.64%	28.48%
1939	0.41%	2.40%	-1.99%
1940	-9.78%	2.23%	-12.01%
1941	-11.59%	1.94%	-13.53%
1942	20.34%	2.46%	17.88%
1943	25.90%	2.44%	23.46%
1944	19.75%	2.46%	17.29%
1945	36.44%	2.34%	34.10%
1946	-8.07%	2.04%	-10.11%
1947	5.71%	2.13%	3.58%
1948	5.50%	2.40%	3.10%
1949	18.79%	2.25%	16.54%
1950	31.71%	2.12%	29.59%
1951	24.02%	2.38%	21.64%
1952	18.37%	2.66%	15.71%
1953	-0.99%	2.84%	-3.83%
1954	52.62%	2.79%	49.83%
1955	31.56%	2.75%	28.81%
1956	6.56%	2.99%	3.57%
1957	-10.78%	3.44%	-14.22%
1958	43.36%	3.27%	40.09%
1959	11.96%	4.01%	7.95%
1960	0.47%	4.26%	-3.79%
1961	26.89%	3.83%	23.06%
1962	-8.73%	4.00%	-12.73%
1963	22.80%	3.89%	18.91%
1964	16.48%	4.15%	12.33%
1965	12.45%	4.20%	8.25%
1966	-10.06%	4.49%	-14.55%
1967	23.98%	4.59%	19.39%
1968	11.06%	5.50%	5.56%
1969	-8.50%	5.95%	-14.45%
1970	4.01%	6.74%	-2.73%
1971	14.31%	6.32%	7.99%
1972	18.98%	5.87%	13.11%
1973	-14.66%	6.51%	-21.17%
1974	-26.47%	7.27%	-33.74%
1975	37.20%	7.99%	29.21%
1976	23.84%	7.89%	15.95%
1977	-7.18%	7.14%	-14.32%
1978	6.56%	7.90%	-1.34%
1979	18.44%	8.86%	9.58%
1980	32.50%	9.97%	22.53%

Historical Market Risk Premium, 1926-2021

Year	Large Co Stock Total Return Table A-1	Income Only Returns LT Govt Table A-7	Observed Equity Premium
1981	-4.92%	11.55%	-16.47%
1982	21.55%	13.50%	8.05%
1983	22.56%	10.38%	12.18%
1984	6.27%	11.74%	-5.47%
1985	31.73%	11.25%	20.48%
1986	18.67%	8.98%	9.69%
1987	5.25%	7.92%	-2.67%
1988	16.61%	8.97%	7.64%
1989	31.69%	8.81%	22.88%
1990	-3.11%	8.19%	-11.30%
1991	30.47%	8.22%	22.25%
1992	7.62%	7.26%	0.36%
1993	10.08%	7.17%	2.91%
1994	1.32%	6.59%	-5.27%
1995	37.58%	7.60%	29.98%
1996	22.96%	6.18%	16.78%
1997	33.36%	6.64%	26.72%
1998	28.58%	5.83%	22.75%
1999	21.04%	5.57%	15.47%
2000	-9.10%	6.50%	-15.60%
2001	-11.89%	5.53%	-17.42%
2002	-22.10%	5.59%	-27.69%
2003	28.68%	4.80%	23.88%
2004	10.88%	5.02%	5.86%
2005	4.91%	4.69%	0.22%
2006	15.79%	4.68%	11.11%
2007	5.49%	4.86%	0.63%
2008	-37.00%	4.45%	-41.45%
2009	26.46%	3.47%	22.99%
2010	15.06%	4.25%	10.81%
2011	2.11%	3.82%	-1.71%
2012	16.00%	2.46%	13.54%
2013	32.39%	2.88%	29.51%
2014	13.69%	3.41%	10.28%
2015	1.38%	2.47%	-1.09%
2016	11.96%	2.30%	9.66%
2017	21.83%	2.67%	19.16%
2018	-4.38%	2.82%	-7.20%
2019	31.49%	2.55%	28.94%
2020	18.40%	1.53%	16.87%
2021	28.70%	1.73%	26.97%
Arithmetic average	12.34%	4.87%	7.46%

Source: Kroll, 2022 Stocks, Bonds, Bills, and Inflation (SBBI) Yearbook